DOCUMENT RESUME

ED 128 110 RC 005 860

AUTHOR	Anderson, Kenneth E.; And Others
TITLE	The Educational Achievement of Indian Children. A Re-Examination of the Question: How Well Are Indian Children Educated?
INSTITUTION	Bureau of Indian Affairs (Dept. of Interior), Washington, D.C.
PUB DATE	Mar 53
NOTE	130p.
EDRS PRICE	MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS	*Academic Achievement; *American Indians; Boarding Schools; Caucasian Students; Comparative Analysis; Cultural Differences; Day Schools; *Diagnostic Tests; *Educational Testing; Geographic Regions; Grade 8; Grade 12; Public Schools; Reading Ability; Secondary Education; *Statistical Data; Test Results; Vocabulary Skills; Writing Skills

ABSTRACT

Designed to complete a cycle begun in 1946, the 1950 Service-Wide Testing Program examined: the progress and achievement made by American Indian students in various educational situations, and the factors thought to affect their educational development. Tests were administered to all students in grades 8 and 12 enrolled in day, mission, public, nonreservation boarding, and reservation boarding schools located in nine geographic areas--Alaska, Dakota, Mountain, Navajo, Oklahoma, Pacific, Pueblo, Southeast, and Southwest. The tests included: Pressey Diagnostic Reading, Grades 3-9, Form A; Arithmetic-Factor Abilities, Form USIS--FA-A-1-47; Free Writing Test, Form C, USIS--FWA-C-48; Use of Resources--USIS-3-46; Pressey English, Grades 5-8; Gates Basic Reading, Grades 3-8; Orleans Arithmetic Computation, Form I, Grades 3-8; and Health and Safety--USIS-HS-A-47. These tests were not all administered in both grades. The mean, standard deviation, plus one standard deviation, and minus one standard deviation were calculated for 360 distributions. Data were also obtained on the student's degree of Indian blood, language spoken at home, home stability, place of residence, kinds of friends, late entrance to school, size of school attended, regularity of school attendance, and academic ambition. It was found that as the cultural and educational backgrounds of Indian children became more like those of white children in the public schools, the educational achievement of Indian children matched that of white children more closely. (NQ)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED128110

RC
F-Int

The Educational Achievement Of Indian Children

A Re-examination of the Question: How Well Are Indian Children Educated?

RECEIVED
JAN 28 1972
NMSU
E.R.I.C.

by

Kenneth E. Anderson
Director of the Bureau of Educational Research
and Service

E. Gordon Collister
Director of the Guidance Bureau

Carl E. Ladd
Research Fellow

Consultants to the Indian Research and Testing Programs
University of Kansas

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

2

BUREAU OF INDIAN AFFAIRS
DEPARTMENT OF THE INTERIOR

RC005960

DEPARTMENT OF THE INTERIOR
Douglas McKay, Secretary

BUREAU OF INDIAN AFFAIRS
Dillon S. Myer, Commissioner

BRANCH OF EDUCATION
Hildegard Thompson, Chief

Authorized by Congress

Printed at
Haskell Institute Print Shop
Lawrence, Kansas
March, 1953—4,000
Price $1.25

ACKNOWLEDGEMENT

The writers wish to thank L. Madison Coombs, Education Specialist for the Bureau of Indian Affairs, for valuable advice and assistance in the preparation of this volume.

Contents

Page

List of Tables vii
List of Figures ix
Foreword—by Willard W. Beatty xi
Chapter I. Introduction 1
  Previous Studies 1
  Problems of Indian Education 1
  The Previous Testing Program 4
  The 1950 Testing Program 11
  The University of Kansas 13
  Summary 13
Chapter II. Differences in Student Background 14
  Introduction 14
  Composition of Types of Schools by Areas 15
  Cultural Backgrounds of the Students 15
    Degree of Indian Blood 15
    Education of Parents 17
    Language Spoken in the Home 18
    Home Stability 19
    Permanent Residence 20
    Kinds of Friends 21
  Educational Characteristics of the Students 22
    Grade Placement and School Attendance 22
    Size of School Attended 24
    School Attendance 24
    Males and Females Enrolled 25
    Academic Ambition 26
  Summary 26
Chapter III. Statistical Treatment of the Test Data 28
  Introduction 28
  General Procedures 28
  Further Analysis 29
  Summary 32

p iv blank

Chapter IV. Results of the Statistical Treatment
of the Test Data 34
Introduction 34
Achievement of Indian Children in
Various Geographic Areas 34
Achievement of Indian Children
in the Eighth Grade 34
Achievement of Indian Children
in the Twelfth Grade 47
Comparison of Areas by Grade Levels 60
The Achievement of the Eighth and Twelfth Grades
on the Same Tests 60
Achievement of the Eighth and Twelfth Grade Students
by Types of Schools 61
Achievement of the Eighth Grade Students
by Types of Schools 62
Achievement of the Twelfth Grade Students
by Types of Schools 69
Comparison of Types of Schools by Grade Levels .. 77
Summary 77
Chapter V. Conclusions and Plans for the Future 78
Educational Accomplishments of Indian Children in the
Various Types of Schools 78
Grade Eight 78
Grade Twelve 78
Relationships Between Achievement and Cultural and
Educational Factors 79
The Future 80
Tour of the Southwest 80
The Intermountain Conference 82
The Albuquerque Conference 88
Bibliography 89
Appendix—United States Indian Bureau Tests 91

List of Tables

Table Page

1. Tests and Materials Used in the April 1950 Testing Program 12
2. Composition of Types of Schools by Areas for the Two Grade Levels 16
3. Percentage of Students Having Various Degrees of Indian Blood for Two Grade Levels 16
4. Average Years of School Attendance of Parents of Children Enrolled in Grade Four in 1946 and in Grade Eight in 1950 18
5. Percentage of Indian Students Usually Speaking the Pre-School Language Indicated 19
6. Percentage of Indian Students in Eighth Grade in 1950 Living With Both Parents, One Parent, Relatives or Others 20
7. Percentage of Students Living in Centers of 500 or More Population 21
8. Kinds of Friends by Type of School for Two Grade Levels 22
9. Age of Students in Relation to Grade Placement 22
10. Number of Years of School Attendance in Relation to Grade Placement 23
11. Size of School Attended by Children in Grade Eight 24
12. Median Number of Days Attended by Children for Two Grade Levels 25
13. Percentage of Students Attending from 155 to 184 Days for Two Grade Levels 25
14. Percentage of Males and Females by Types of Schools for Two Grade Levels 26
15. Percentage of Indian Students Desiring to Complete the Various Grades or Courses 26
16. Percentage of Students in the Eighth Grade Exceeding the Mean of the Twelfth Grade 61
17. Critical Ratios for Grade 8 on **Pressey Vocabulary Test** 63
18. Critical Ratios for Grade 8 on **Gates Basic Reading-Type A** 63
19. Critical Ratios for Grade 8 on **Gates Basic Reading-Type C** 64

20. Critical Ratios for Grade 8 on **Pressey English-Section A** 64
21. Critical Ratios for Grade 8 on **Pressey English-Section B** 65
22. Critical Ratios for Grade 8 on **Pressey English-Section C** 65
23. Critical Ratios for Grade 8 on **Pressey English-Section D** 66
24. Critical Ratios for Grade 8 on **Arithmetic-Factor Abilities** 66
25. Critical Ratios for Grade 8 on **Orleans Arithmetic Computation** 67
26. Critical Ratios for Grade 8 on **Free Writing-Length** 67
27. Critical Ratios for Grade 8 on **Free Writing-Errors** 68
28. Critical Ratios for Grade 8 on **Use of Resources** 68
29. Critical Ratios for Grade 12 on **Pressey Vocabulary Test** 70
30. Critical Ratios for Grade 12 on **Gates Basic Reading-Type B** 71
31. Critical Ratios for Grade 12 on **Gates Basic Reading-Type D** 71
32. Critical Ratios for Grade 12 on **Pressey English-Section A** 72
33. Critical Ratios for Grade 12 on **Pressey English-Section B** 72
34. Critical Ratios for Grade 12 on **Pressey English-Section C** 73
35. Critical Ratios for Grade 12 on **Pressey English-Section D** 73
36. Critical Ratios for Grade 12 on **Arithmetic-Factor Abilities** 74
37. Critical Ratios for Grade 12 on **Free Writing-Length** 74
38. Critical Ratios for Grade 12 on **Free Writing-Errors** 75
39. Critical Ratios for Grade 12 on **Use of Resources** 75
40. Critical Ratios for Grade 12 on **Health and Safety** 76

List of Figures

Figure Page

1. **Pressey Vocabulary Test**, Mean Score + and — One Standard Deviation, Grade 8, 1950 35
2. **Gates Basic Reading Test-Type A**, Mean Score + and — One Standard Deviation, Grade 8, 1950 36
3. **Gates Basic Reading Test-Type C**, Mean Score + and — One Standard Deviation, Grade 8, 1950 37
4. **Pressey English Test-Section A (Capitalization)**, Mean Score + and — One Standard Deviation, Grade 8, 1950 38
5. **Pressey English Test-Section B (Usage)**, Mean Score + and — One Standard Deviation, Grade 8, 1950 39
6. **Pressey English Test-Section C (Punctuation)**, Mean Score + and — One Standard Deviation, Grade 8, 1950 40
7. **Pressey English Test-Section D (Sentence Structure)**, Mean Score + and — One Standard Deviation, Grade 8, 1950 41
8. **United States Indian Bureau Arithmetic Test, Factor Abilities**, Mean Score + and — One Standard Deviation, Grade 8, 1950 42
9. **Orleans Arithmetic Computation Test**, Mean Score + and — One Standard Deviation, Grade 8, 1950 43
10. **United States Indian Bureau Free Writing Test-Length**, Mean Score + and — One Standard Deviation, Grade 8, 1950 44
11. **United States Indian Bureau Free Writing Test-Errors** (Per 60 Words), Mean Score + and — One Standard Deviation, Grade 8, 1950 45
12. **United States Indian Bureau Use of Resources Test**, Mean Score + and — One Standard Deviation, Grade 8, 1950 46

13. **Pressey Vocabulary Test,** Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 48
14. **Gates Basic Reading Test-Type B,** Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 49
15. **Gates Basic Reading Test-Type D,** Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 50
16. **Pressey English Test-Section A (Capitalization),**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 51
17. **Pressey English Test-Section B (Usage),** Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 52
18. **Pressey English Test-Section C (Punctuation),**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 53
19. **Pressey English Test-Section D (Sentence Structure).**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 54
20. **United States Indian Bureau Arithmetic Test,**
Factor Abilities, Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 55
21. **United States Indian Bureau Free Writing Test-Length,**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 56
22. **United States Indian Bureau Free Writing Test-Errors**
(Per 60 Words), Mean Score
+ and — One Standard Deviation,
Grade 12, 1950 57
23. **United States Indian Bureau Use of Resources Test,**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 58
24. **United States Indian Bureau Health and Safety Test,**
Mean Score + and — One Standard Deviation,
Grade 12, 1950 59

Foreword

During the dozen years following the Meriam Survey of the Indian Service published in 1928 significant modifications were made in the curricula of many Federal Indian schools. The fact that many children were entering school unable to speak English, caused greater emphasis to be placed on teaching spoken English in the early grades; the fact that Indians in many areas needed to learn new vocational skills in order to farm successfully, derive maximum profit from livestock, take advantage of employment opportunities in non-Indian areas, or provide themselves with more satisfactory living conditions, led to the introduction into the elementary and high school grades of pre-vocational and vocational training suited to the needs of each area; the fact that changed diets, newly introduced diseases, and new types of clothing were inevitable results of living in areas surrounded by an alien culture, led to school emphasis on instruction in home economics and health education, even in the primary grades.

Non-Indian children attending public schools in adjacent areas seldom had need for as much school instruction of this kind, for they were exposed in their homes to daily experiences by which they adjusted to the culture pattern of their parents, which already included many of these knowledges and skills. It was assumed by Indians and non-Indians alike, that the Federal schools would prepare their pupils adequately in the standard subjects of the public school curriculum. Few persons besides the school employees realized that the Federal schools were undertaking this dual job, or knew that when this new program was introduced, more than 80 per cent of the pupils in Federal Indian schools were retarded by from one to six years in reaching the academic standards of the public schools.

By 1943 it appeared desirable to invite a qualified, impartial, outside agency to join with the Indian Service in measuring whether pupils in Federal schools were in fact learning the essential subject matter of the public school curricula of the several states, and were or were not gaining the vocational, health and social adjustment goals designed to bring them abreast of the public school children who were being raised in typical American non-Indian homes.

Dr. Ralph Tyler, Chairman of the Department of Education of the University of Chicago, and his associates had achieved nationwide recognition in the field of educational measurements during the preceding decade, so it was proposed that they undertake the direction of a study of Indian school achievement. A contract with the University was signed in 1943. The University staff first sought commercial tests of reading, arithmetic and language, which might produce valid results when used in rural areas; second the staff began to devise special tests to measure important aspects of the Indian school program which were not common to the average public school. These studies were completed during 1944. In 1945 and 1946 the selected tests were given to all pupils in the fourth, eighth and twelfth grades in Federal Indian schools, and to pupils in the same grades of many cooperating mission and public schools. While several members of the University of Chicago staff served as coordinators of the Indian school study during the period of the contract, Dr. Shailer Peterson actively directed the administration and evaluation of the tests during these two years, and prepared the monograph **How Well Are Indian Children Educated?**[1] which summarized the findings of the study.

The Peterson monograph recorded the first full-scale evaluation of the school work of Indian children. It was therefore impossible to refer to previous data, to confirm or explain certain apparent trends. For verification, it was decided to apply the same tests to eighth and twelfth grade pupils in 1950 (four years later), when many of the same pupils who had been tested in 1946 would again appear at the next higher level of the testing pattern. Unfortunately World War II intervened, and many eighth grade pupils who might have been expected to appear four years later in the twelfth grade became diverted into war work, and many younger pupils were taken out of school for varying periods while their parents engaged in war work. The 1950 tests therefore do not constitute as complete a comparison as it had been hoped that they might. However, the number of children who had appeared in the 1946 tests and who reappear in the 1950 scores is sufficient to make the restudy highly informative.

The earlier cooperation with the University of Chicago, which had begun while the Indian Bureau was headquartered in Chicago, became less convenient when the responsibility for the educational testing program was placed in the hands of L. Madison Coombs at Haskell Institute. Discussions with the staff at the School of Education at the University of Kansas revealed that Kenneth E. Anderson, Director of the Bureau of Educational Research and Service, and E. Gordon Collister, Director of the Guidance Bureau, would be willing to undertake the responsibility for continuing the planning and interpretation of the work of the Indian Service testing program. A contract with the University of Kansas was signed in 1950. This monograph summarizing the data growing out of the 1950 follow-up tests, is therefore the work of these gentlemen.

---

[1] **How Well Are Indian Children Educated?** by Dr. Shailer Peterson, Haskell Institute, Lawrence, Kansas. 1948.

The Peterson study brought out certain facts about the Indian population and about the work of Indian school children. It permitted certain conclusions to be drawn, but it also raised some questions which could not be answered until further tests were made. The present study affirms some of the earlier conclusions and supplies answers to some of the questions.

It has become clear that there is considerable difference between the Indians living in different parts of the country. It is also clear that mixedbloods often differ considerably from fullbloods —but not because of the infusion of blood from non-Indian parents. To the extent that the home environment and the language spoken in the home resemble that of the non-Indian community, the children coming from that home will resemble their non-Indian associates. To the extent that children live in a home where habits, traditions and beliefs are those of the Indian group, and one of the many Indian languages is spoken customarily, the children will find it more difficult to master the English language and to adjust to the culture patterns of non-Indian life. Cultural experience, not blood-quantum, influences assimilation; the confusion grows out of the fact that the two often go together.

In general, the Indians of the Mountain States and the Pacific Coast have inter-married freely with non-Indians, and the proportion of fullbloods is small. In Oklahoma, the inter-marriage with whites has been much more general on the east side of the state than on the west. Few fullbloods remain among the members of the original Five Tribes; while considerable numbers of fullbloods are found among the woodland and plains tribes. For the most part, the mixedblood Indians live among whites. It is usually the children of the less assimilated Oklahoma Indians who are still found in Federal schools.

In the Dakotas, intermarriage has occurred largely between the Indians living on the fringes of the reservations and their non-Indian neighbors. Their children attend nearby public schools. Many completely fullblood Indian communities remain. They are usually in the heart of the reservation where there are no public schools and their children attend Federal day or boarding schools.

Among the Pueblos, Navajos, Apaches, Pimas and Papagos of the Southwest, intermarriage with non-Indians seldom takes place. Among each of these tribal groups, there are many Indians who have little contact with non-Indians. For the most part, their children are in Federal schools.

The Peterson study showed that the ratio of fullbloods in any area bore a direct relationship to the non-use of English in the Indian home. This in turn influenced classroom instruction, because it takes a year or more to develop the use of English upon the part of a pupil who has no use of the language when first enrolled.

In the Peterson study, the foregoing facts led to a division of the schools studied on geographic lines. The geographic distribution of 1945-46 scores has been retained in the present study.

The 1945-46 study also established that the Federal day schools enroll a large proportion of fullbloods; the nonreservation boarding schools a smaller proportion. Indian children enrolled in public schools are mostly mixedbloods. Because other environmental factors which influence the educational program also differ greatly in the several types of schools, it seemed wise to segregate the 1950 test scores by the same school types.

This subdivision of results by geographic areas as well as by types of schools, permits certain comparisons between the educational achievement of Indian children in the several areas, and in the different types of schools. For these differences to be meaningful, however, it is essential to remember that the children themselves also differ greatly. Due to continued cooperation by many mission and public schools enrolling Indian children, it is possible again to compare the educational success of Indian children with rural white children in similar areas.

In presenting the 1945-46 study, Peterson in his initial chapter attempted to answer certain specific questions which had been raised by Indian Service administrators. The present study sheds further light on some of these questions.

1. **Has there been any progress in Indian Education since the report in 1928 of the Meriam Survey?** Peterson's answer was "yes," and he showed a substantial reduction in retardation. While 42 per cent of the Indian children had been retarded four or more years in 1928, by 1946 this percentage had been reduced to 6 per cent. For the 21 per cent who had been not more than one year retarded in 1928, Peterson found this proportion to have increased to 64 per cent in 1946. As at least one-third of the children in Federal schools continued to enter the first grade without any knowledge of English, at least a year of retardation is not surprising.

The figures, such as they are for 1950, show no great change in these proportions.

2. **Is there any difference in educational accomplishment between the Indian children in nonreservation and reservation boarding schools, mission boarding schools, Indian day schools and public schools?** The 1946 tests showed that Indian children (mostly

mixedbloods) who were attending public schools with non-Indian children, did better on reading, arithmetic and language tests, than Indian children attending other types of schools. The accomplishment of Indian children in the other schools shows that those in nonreservation, mission, reservation boarding, and Federal day schools follow in that order.

Briefly, the 1950 study shows the same rank order of achievement.

3. **Is there any difference between the performance of Indian and non-Indian children in the rural public schools?** Peterson found a slight difference in favor of the Indians in some tests; a slight difference in favor of non-Indians on others.

In 1950 we find slight but significant differences in favor of the non-Indian children in all of the standardized tests.

4. **Is there any difference in the relative performance of Indian children at the different grade levels?** Peterson found that the fourth grade group made consistently better scores in comparison to standardized norms and in comparison to public school non-Indians, than the pupils in the upper grades. This conclusion may be integrated with question 6, **Is there a difference between the students in the lower grades and those in the higher grades?** To which the answer also was "yes." "Comments by teachers all indicate these younger students to be better, and some teachers believe the difference between two classes one year apart is very marked. It is probable that the more systematically organized program of instruction, keyed to Indian needs, accounts in large part for this clear-cut superiority."

As there was no previous report of achievement with which to compare these fourth graders, Peterson had to depend on the better comparative scores made by fourth graders, and the subjective testimony of teachers, to conclude that better teaching had caused the better results. In 1950, no fourth graders were tested, but the "superior" fourth graders of 1946 were eighth graders in 1950. Another measure has been chosen to determine whether or not the apparent superiority of this group has been maintained. In 1950, using the same tests for both eighth and twelfth graders, the percentage of overlap has been studied. "The percentages of overlap . . . are quite considerable, indicating that the students in the eighth grade had achieved higher standards than their counterparts in the twelfth grade. This seems to indicate that an upsurge is taking place in Indian education."

The remainder of the 1946 questions dealt with problems not specifically touched on in 1950. In general the 1950 study of cultural factors, as they affect the education of Indian children, lends support to the statement: "that as the cultural and educational backgrounds of Indian children become more like those of white children in public schools, the more closely will the educational achievement of Indian children match that of white children."

The wider curricula and the better teaching in Indian schools in the years which followed the publication of the Meriam Survey are clearly contributing to a more rapid assimilation by the Indian children in Federal schools, of the educational and cultural patterns of the surrounding majority, which is generally agreed by both Indians and non-Indians to be a desirable development.

Another study of the work of Federal Indian schools, "Education for Better Living" by George A. Dale, which evaluates the program of practical education on the Pine Ridge Reservation since 1936, in terms of the reactions of the students who took part, will be published in 1953.

In introducing these several studies of educational work in Federal Indian schools, it may be well to quote again from Peterson's report, for his statement is as true today as it was in 1948. "The Bureau of Indian Affairs is not competing with the public school system. Wherever public schools exist, the Indian Service has taken advantage of public education and placed Indian children in public schools. Where public education has not been able to accept the responsibility of educating Indian children, the Federal schools have performed an effective job, as indicated by the findings of this survey. The data available prove that Indian education has progressed far toward its goals, which combine an understanding of and respect for the Indian tribal lore and art, with the full educational opportunities of the non-Indians."

Through critical self-examination, progress is possible.

Willard W. Beatty.

Chapter I

Introduction

PREVIOUS STUDIES

The years 1944, 1945, and 1946 marked an unusual departure in Indian education, for it was during these years that a service-wide evaluation of Indian education was conducted for the Bureau of Indian Affairs by the Department of Education of the University of Chicago. This service-wide evaluation was presented in a monograph entitled **How Well Are Indian Children Educated?** The monograph was a summary of the results of a three-year program testing the achievement of Indian children in federal, public, and mission schools. This excellent contribution to Indian education was authored by Dr. Shailer Peterson, then of the University of Chicago. The monograph also included chapters by Dr. Ralph Tyler of the University of Chicago, and Dr. Willard Beatty, Chief, Branch of Education of the Bureau of Indian Affairs. The volume was printed at the Haskell Institute Print Shop, Lawrence, Kansas, in September of 1948.

PROBLEMS OF INDIAN EDUCATION

In order to orient the reader to Indian education and its problems, we quote:[1]

The Indian Bureau-wide Testing Project, reported in this monograph, had two main purposes: (1) to examine the progress and achievement that the Indian students had made in various types of educational situations; (2) to examine those factors which were thought to be related to the student's educational development and to uncover any other factors which might prove to be related.

This first chapter becomes, in a sense, a summary of the monograph, for it answers with information gathered from this study many of the questions commonly raised by those interested in Indian education. Moreover, this chapter provides some of the background essential to an understanding of the study and the information that it has revealed.

The following chapters describe in detail the methods by which the test battery was developed, administered and interpreted.

---

[1] Shailer Peterson. **How Well Are Indian Children Educated?** Lawrence, Kansas, Haskell Institute Print Shop, 1948. pp. 9-12.

For approximately twelve years, there has been a definite and expressed philosophy directing the program of education in the schools of the United States Indian Service. This is summarized in the introductory statement of the Civil Service examination prepared for the Indian Service teachers. It reads as follows:

The primary objectives of Indian schools are: To give students an understanding and appreciation of their own tribal lore, art, music, and community organization; to teach students through their own participation in school and community government to become constructive citizens of their communities; to aid students in analyzing the economic resources of their reservation and in planning more effective ways of utilizing these resources for the improvement of standards of living; to teach, through actual demonstration, intelligent conservation of natural resources; to give students first-hand experience in housing and clothing, in subsistence gardening, cooperative marketing, farm mechanics, and whatever other vocational skills are needed to earn a livelihood in the region; to develop better health habits, improve sanitation, and achieve higher standards of diet with a view to prevention of trachoma, tuberculosis, and infant diseases; to give students an understanding of the social and economic world immediately about them and to aid them in achieving some mastery over their environment; and to serve as a community center in meeting the social and economic needs of the community.

Obviously this philosophy has required attention to training Indian children so that they may be able to make a living from the natural resources of their home environment, as well as to make a living away from their reservation. This educational program has not resulted in neglecting the usual type of academic instruction which includes reading, writing, arithmetic, geography, history, and science. Instead, to these academic subjects has been added emphasis on those skills needed to make the best use of the resources of the environment. These extra skills have included an understanding of desirable health practices, domestic living, and practical training in one or more of a variety of vocational fields, each of which is important not only on the reservation but away from the reservation in both rural and urban localities.

It is evident that education is as important in the life of an Indian as it is in the life of a non-Indian. Many Indian children do not come to school the first day possessing a familiarity with the English language or with much of the background experience which is common to the lives and environment of most white children. Experiences and skills that are taken for granted by the teachers of white children in the kindergarten or first grade cannot be taken for granted by the teachers of Indian children.

One out of every three children from the hills of eastern Oklahoma or from the Dakota Sioux reservations comes with an extremely limited English vocabulary, being accustomed to doing most of his speaking and thinking in his native Indian language. In the Papago country of southern Arizona and throughout the Navaho reservation, the great majority of children who enroll in the federal schools are unable to understand English at all when they enter school. The teachers of such children are therefore confronted with students who have been speaking and thinking in only their native tongue. Among the Pueblos, still another problem presents itself, for here many of the children are tri-lingual, speaking a little Spanish and a little English mixed with a large proportion of Indian dialect.

The problem of having to teach the student English before he can be taught reading, writing, arithmetic, and geography is peculiar to the Indian Service. Few public schools, other than those located on the Mexican border, have a similar problem. In most public schools, it is the exception if teachers are confronted with a non-English-speaking child. In the Indian Service, some schools rarely have beginning students who know English, and in almost all schools the language problem is ever present.

In federal schools the curricula and teaching methods are necessarily different from those employed in most public schools because of the differences which exist between beginning Indian children and white children. Teachers who have had their training and practice teaching in the environment of the average public school find the problems of the Indian school to be quite different. In-service training programs have been necessary to prepare the new teachers for this new kind of experience. Special summer school training and specially prepared materials have been used to acquaint new teachers with the problems which are not a part of most methodology textbooks.

Those who are uninformed or misinformed about the problems of Indian education are often critical when they learn that Navaho youngsters are a year or two behind the grade level expected of white children of the same age. Those who find Indian Bureau schools devoting a large part of the first year to the acquisition of a useful and functional English vocabulary, consider it strange that the teaching of reading is usually delayed to the second year. Similarly, new Indian Service teachers coming from the public schools at first wonder why it is that the Bureau of Indian Affairs does not advocate close adherence to those courses of study commonly accepted and advocated for the public schools of the states in which the Bureau of Indian Affairs operates. These new teachers first fear *that without these "accepted" courses of study, their students cannot possibly make satisfactory progress.*

Those who have directed the Indian schools have watched the results of their specially adapted program of teaching, and have made changes and modifications as they seemed desirable. In the past, however, there has not been a planned evaluation program for obtaining an over-all picture of Indian education through the years. The absence of such information is particularly notable now that data are being gathered about the present status of the educational program. A point of reference for comparison purposes would now be very useful. In 1944, the Chief, Branch of Education, Bureau of Indian Affairs, and his associates requested the cooperation of the Department of Education of the University of Chicago, in planning and administering a service-wide evaluation in an endeavor to answer numerous questions which have arisen over the years. The details of this cooperative effort will be described in the following chapters of this monograph. The remainder of this chapter will be devoted to reporting the results of three years of a carefully conducted evaluation program by listing the questions that have been asked and giving the answers that have so far been obtained.

THE PREVIOUS TESTING PROGRAM

The scope and comprehensiveness of the testing programs conducted in 1944, 1945, and 1946, is best shown by quoting from Peterson's monograph:[2]

Indian groups throughout the country differ greatly in their cultural background. Some Indian school children belong to tribes to whom educational opportunities have been available for as long as 150 years, whereas others belong to tribes in which these children are the first generation to whom educational opportunities have been available. Differences also exist as a result of contrasting environments. Many Indian children are bilingual and most of them have rural backgrounds. Since most standardized tests depend upon language—the language of urban life—such tests have limitations. An evaluation of the achievement of Indian children by merely comparing their scores on verbal tests with the scores of white children from urban communities would tell little or nothing concerning the attainment of the Indian children. It had been suggested that one might find relatively little difference between the achievement of Indian children who attend public schools and white children from rural environments, since those who attend public schools come from less isolated environments than do the

---

[2] **Ibid.** pp. 20-26.

majority of the Indian children in federal schools. Another factor indicated for study was the difference in environment offered to pupils by different kinds of Indian schools.

Most day school students have no contact with English except during the few hours when they are in school, whereas the students in boarding schools are exposed to English during the entire twenty-four hours of the day. Probably the most important difference in school environment is that which relates to the special curricula provided students in Indian schools. The home environment of most Indian students does not provide them with certain types of training in health practices, rural practices and home economics, which most rural white children receive at home. Because of this, the Indian schools attempt to provide those things which are not always included in the public school curriculum. Moreover the vocational objectives of many of the Indian groups differ from the objectives of other Indian groups or white students to the extent that the curriculum in each school must be adapted to the special needs of its students.

It was decided that certain measuring instruments should be tried experimentally during 1944, the first year of the study. Staff members from the Branch of Education, Bureau of Indian Affairs, with the assistance of staff members of the department of Education of the University of Chicago, analyzed existing tests. Where suitable tests were not available, they constructed tests in those fields of rural life education to which Indian schools devote considerable attention. The selection and preparation of the measuring instruments finally employed, resulted from a consideration of the following:

(1) the immediate and far-reaching purposes of the testing program,

(2) the educational program suited to the needs of students now enrolled in Indian schools,

(3) the level of Indian pupil achievement in tool subjects such as reading, English, arithmetic and penmanship,

(4) the effect that certain differences in educational and home environments (e. g. school attended, language of the parents, etc.) may have had upon the Indian student's achievement,

(5) the available measuring instruments with particular reference to:

(a) their wide age or educational range, thereby making the test suitable for students with widely differing abilities,

(b) reliability or dependability of the measure,

(c) *validity for purposes intended,*
(d) *simplicity of directions,*
(e) *ease of indicating answers or choices,*
(f) *simplicity of scoring,*
(g) *availability of useful norms,*
(h) *strange or unusual vocabulary,*

(6) the assembly of information that will provide a better understanding of Indian students and their families,

(7) the assembly of information which lends itself to a useful, long-range program.

Table II-1 lists the evaluation instruments which were selected or prepared for use in the trial program in 1944. The standardized tests included were selected because it was believed they would meet many of the requirements of the program.

TABLE II-1—TESTS USED APRIL 1944

Name of Test	**Form Used**
Iowa Every-Pupil Tests	*Test A. Silent Reading Comprehension, Form 0*
Iowa Every-Pupil Tests	*Test C. Basic Language Skills, Form 0*
Iowa Every-Pupil Tests	*Arithmetic, Parts I, II and III, Form 0*
Natural Resources	*USIS—1944 (Mimeographed edition)*
Health and Safety	*USIS—1944 (Mimeographed edition)*

The Iowa Every-Pupil Tests, used in the trial battery of tests, employ a rather complicated system of answering items in order to facilitate mechanical scoring. Such a scheme presented an additional and unnecessary hurdle to Indian children, unfamiliar with this method of response. A review of the difficulties encountered by the students on items in the reading and arithmetic tests in the Iowa battery also revealed that the types of errors seemed to be caused by the fact that the content material was foreign to rural experience, thereby defeating the purposes of the tests. For those two reasons, the Iowa battery was replaced in 1945 by other tests as indicated in Table II-2.

The Indian Bureau tests in Natural Resources and Health and Safety (the Rural Practices Tests) administered experimentally in 1944 proved to contain certain language hurdles. Consequently, these tests were revised in the light of these findings and other tests were prepared for inclusion in the 1945 program. In all of these, there was an effort to minimize the reading skill required for understanding and responding to each content item.

The pilot study of 1944 was exceedingly helpful in revealing many additional factors which required consideration in this program. The results were based on samples too small to warrant any conclusions concerning the achievement of Indian students.

As indicated in Chapter 1, it was decided that the 1945 program should include all of the eighth grade students in Indian schools, as well as students in a selected group of public and mission schools. The total number of students tested in each type of school was as follows:

1945 Distribution of Students Tested

Boarding School Students	281
Day School Students	378
Mission School Students	196
Nonreservation School Students	198
Miscellaneous Indian Students	246
Public School Students	786
Total Students	2,085

The test battery was administered in each of the schools by personnel selected by the area superintendent of education. Only persons who had previously had test experience were used in the administration and in 1945 the tests were administered by persons not connected with the schools in which they were given. Table II-2 lists the test battery given to all eighth grade students in the spring of 1945.

All of the papers from this program were scored in the Chicago Office by a group of well qualified teachers. Reports on the performance of each individual student within a school, together with graphic norm sheets showing the distribution of scores in each type of school and in each region included, were then distributed to the administrators of the schools which participated.

TABLE II-2
TESTS AND MATERIALS USED APRIL 1945

Name of Test or Sheet	Form Used
Background Questionnaire	*USIS—Haskell-3-10-45*
Sample Test Sheets	*USIS—Haskell-3-10-45*
Gates Basic Reading Test	*Form 4. Types A, B, C, D*
Pressey Reading Test	*Vocabulary Section Only*
Pressey English Test	*Form C. Parts A, B, C, D*
Orleans Arithmetic Test	*B—Computation Form I*
Orleans Arithmetic Test	*C—Reasoning Form I*
Home Economics	*USIS—HE-45*
Use of Resources	*General—USIS-3-45*
Use of Resources	*Regional USIS—0-45 (for Oklahoma)* *USIS—S-45 (for Southwest)* *USIS—D-45 (for Dakota)* *USIS—M-45 (for Mountain)*
Health and Safety	*USIS—I-45*
Credit	*USIS—2-45*
Free Writing A	*USIS—A-45*
Free Writing B	*USIS—B-45*

A good many tentative conclusions, discussed in detail in the following chapters, resulted from the data collected and assembled in 1945. In addition, the need for other, specific data became apparent. It was recognized that many questions can be answered only by following the progress of the same students during a period of several years. However, it was decided to extend the student sample to include students in grades four and twelve the following year, in order that differences in relation to grade level could be observed. In 1946, the tests were administered again to students in selected public and mission schools in order that comparative data for rural white children, and for Indian children in public and mission schools might be available. The total number of students tested in each grade and in each type of school was as follows:

1946 Distribution of Students Tested*

	Grade 4	Grade 8	Grade 12
Boarding School Students	*413*	*289*	*65*
Day School Students	*956*	*253*	*17*
Mission School Students	*212*	*131*	*35*
Nonreservation School Students	*134*	*134*	*295*
Miscellaneous Indian Students	*228*	*287*	*88*
Public School Students	*950*	*595*	*242*
Total Students	*2,893*	*1,689*	*742*

---

*These figures include only those students for whom sufficient data were available to justify the inclusion of their test scores in the compilation of norm sheets.

The standardized tests used in the 1945 program proved sufficiently satisfactory so that all of them were included in the 1946 battery for twelfth grade students. Several of the same tests were administered to fourth graders in 1946. Use of identical test instruments both years made it possible to compare the new data with that collected from the eighth grade students the previous year. This eliminated the necessity of repeating all of the tests at the eighth grade level in 1946. Many of the schools were supplied with all tests for the eighth grade students at their own request, in order that they might collect additional information on the students in their own schools. The 1945 Credit Test was omitted because the number of items in the test was so small that it was decided to include them at a later date as a part of another test. The use of regional tests in resources presented a number of problems which made it seem advisable to incorporate those items which tended to be somewhat general in nature, into the General Resources Test. In this test all items clearly having only regional significance were omitted. The Rural Practices Vocabulary Test was constructed and administered to students in grades eight and twelve. The Gates Advanced Primary Reading Tests were selected for testing the reading achievement of the fourth grade students. The Background Questionnaire was revised to include additional data for study. Table II-3 lists the tests included in the 1946 battery.

TABLE II-3

TESTS AND MATERIALS USED APRIL 1946

Name of Test and Form Used	**Grades In Which Administered**		
	Fourth	**Eighth**	**Twelfth**
Background Questionnaire, Form Haskell, 3-46	*Yes*	*Yes*	*Yes*
Sample Test Sheet, Form Haskell, 3-45	*No*	*Yes*	*Yes*
Gates Basic Reading Test, Form 4, Types A, B, C, D	*No*	**	*Yes*
Gates Advanced Primary Reading Tests, Types I and II, Form 3	*Yes*	*No*	*No*
Pressey English, Form C, Parts A, B, C, and D	*No*	**	*Yes*
Pressey Reading Test (Vocabulary Section Only) Form A	*Yes*	**	*Yes*
Orleans Arithmetic Computation, Form I	*Yes*	**	*Yes*
Orleans Arithmetic Reasoning, Form I	*No*	**	*Yes*
Rural Practices Vocabulary, Form USIS—A-46	*No*	*Yes*	*Yes*
Free Writing, Form A, USIS—A-45	*Yes*	**	*Yes*
Health and Safety, Form USIS—1-45	*No*	**	*Yes*
Home Economics, Form USIS—HE-45	*No*	**	*Girls only*
USAFI General Science, Form SGSC—1-B-4	*No*	*Oklahoma only*	*Yes*
Use of Resources, Revised, Form USIS—3-46	*No*	*Yes*	*Yes*

**Those principals who wished to do so were permitted to administer these tests to eighth grade students in their own schools.

It was decided that the problems of test administration and scoring would be considerably lessened by the use of a larger number of administrators, and by having the multiple response type test scored in the field. Through the cooperation of area superintendents of Indian education, persons who were well qualified to follow the detailed instructions furnished to them were selected to administer the tests in 1946. In some instances it was recommended that the tests be administered by the classroom teacher. The manual of instructions was prepared in sufficient detail to make the test administration relatively uniform. Area superintendents also arranged for the scoring of all except the Free Writing test. Rechecking indicated that a high degree of grading accuracy was maintained in the field scoring. All of the Free Writing Tests were scored by a small group of teachers who worked under the supervision of one of the staff members from the Chicago Office.

To facilitate a more comprehensive analysis of background data and test results, all of the data collected were coded and entered on punch cards so that machine computations would be possible. Provision has been made to add data to these punch cards from time to time to facilitate growth studies and for making other comparisons.

THE 1950 TESTING PROGRAM

Having provided the reader with some background information regarding Indian education and its problems as well as the nature of the 1944-45-46 testing programs, we turn our attention now to the purpose of the present report.

The present monograph is concerned with the results of the 1950 Service-Wide Testing Program planned and supervised by L. Madison Coombs, Education Specialist, Bureau of Indian Affairs.

The purpose of the 1950 Service-Wide Testing Program was given in the Manual of Instructions for Test Administration and reads as follows:

> *As in former years one of the major purposes of the administration of tests to Indian students in the 1950 program is to provide schools with additional information about students that may be useful in the guidance of these students. In keeping with this purpose, tests have been selected, adapted, and constructed with these students in mind. These tests are designed to provide measures of a number of important abilities or aptitudes, special achievements, and interests.*
>
> *The testing done this spring will, in a sense, complete the cycle begun by the 1946 testing, results of which were published by Dr. Shailer Peterson in the monograph, "How Well Are Indian Children Educated?" Pupils at the fourth and eighth grade levels in 1946 are now, assuming normal progress, at the eighth and twelfth grade levels, respectively, in 1950. A retesting at these last named grade levels this spring should provide much illuminating data.*
>
> *As explained on the page titled, "Test Schedule," not all of the tests given to the twelfth grade will be administered to eighth grade students.*
>
> *This is* **not** *an annual all-pupil testing program such as some state departments and school systems have inaugurated. Instead it is an attempt to provide additional information to the schools so that school personnel may have a better basis on which to guide students and to initiate curriculum studies. It is also important that all school personnel understand that the items included in the various tests do* **not** *constitute a list of facts or skills that should be*

mastered by all students in the Indian Schools. These do not, in any sense, constitute an approved course of study. The range of the tests included is wide in order that they may be used at various grade levels and in different types of schools. Criticisms of any of the items in any of the tests will be welcome, for they will be valuable in future revisions of the tests. **Neither the quality of instruction in any school nor the efficiency of any teacher will be judged by the results of these tests.**

The tests and materials administered in the 1950 testing program and used in this study are shown in Table 1.

TABLE 1
TESTS AND MATERIALS
USED IN THE APRIL 1950 TESTING PROGRAM*

Name of Test or Sheet	Used in Grade	Part Used
Background Information Sheet	8 and 12	Entire sheet
Pressey Diagnostic Reading Grades 3 to 9, Form A	8 and 12	Vocabulary
Arithmetic-Factor Abilities, Form USIS—FA-A-1-47	8 and 12	Entire test
Free Writing Test, Form C, USIS—FWA-C-48 **	8 and 12	Entire test
Use of Resources—USIS-3-46	8 and 12	Entire test
Pressey English, Grades 5 to 8	8 and 12	Sections A, B, C, D
Gates Basic Reading, Grades 3 to 8	8	Type A and C
Gates Basic Reading, Grades 3 to 8	12	Type B and D
Orleans Arithmetic Computation, Form I, Grades 3 to 8	8	Entire test
Health and Safety—USIS-HS-A-47	12	Entire test

---

*Copies of the Bureau of Indian Affairs tests can be found in the Appendix.
**The Free Writing Test was not used in the Alaskan Native Service schools.

THE UNIVERSITY OF KANSAS

The 1950 testing program was outlined and administered prior to the completion of a contract between the Bureau of Indian Affairs and the University of Kansas. Therefore, consultants from the School of Education at the University of Kansas began advisement at the point of punching and sorting of the information gathered in the 1950 testing program by the Bureau of Indian Affairs. The results of this monograph are in a sense, therefore, a post-mortem on the information gathered. This in no way is meant to imply that the testing program was not wisely planned and administered. It is simply to point out the time that the consultants of the University of Kansas entered into the study. The late entry of the University of Kansas consultants made their task somewhat more difficult than it would have been if they had participated in the study from the beginning. In addition, some of the data obtained by administering some of the tests listed in Table 1 were not used in this study. The chief reason for only partial utilization of the data was that some of the tests were measuring abilities which had not been definitely established and explored. In other words, the consultants were not sure just what abilities some of the tests were measuring and whether the tests were doing a good job of measuring the stated abilities.

SUMMARY

It was the purpose of this chapter to present a review of the events leading up to the 1950 testing program. The brief discussion of Indian education and the previous evaluations of Indian education should prove of value to the reader in the forthcoming pages. The present study does not depart markedly from the previous studies of Indian education but is rather a continuation and extension of those studies. The entrance of new evaluators to the scene must of necessity change the points of emphasis here and there. Departures from the previous studies were introduced whenever they clarified the issues involved.

Chapter II

Differences In Student Backgrounds

INTRODUCTION

Since the present study was designed to complete the cycle begun by the 1946 testing, the information gathered by means of the **Background Questionnaire** in the 1950 study was essentially the same as in 1946. Peterson[3] had this to say regarding this phase of the investigation:

> *A great many statements have been made and articles written describing the Indian student, often drawing comparisons between him and white pupils. Good or poor achievement has frequently been explained on the basis of racial or cultural differences between the two groups. Up to the time of this study, no service-wide survey has collected the data needed to draw valid conclusions in regard to:*
>
> *(1) the actual difference between the achievement of Indian students and white children from rural areas,*
>
> *(2) cultural differences between the two groups, or*
>
> *(3) the relation between achievement and cultural differences.*
>
> *It may be said therefore that the objective of this survey is three-fold:*
>
> *(1) to measure the educational achievement of students in Indian schools,*
>
> *(2) to gather data relative to the cultural backgrounds of the Indian and non-urban white students in Indian, public and mission schools, and*
>
> *(3) to determine the relationships, if any, which exist between these measures of cultural background and school achievement.*
>
> *Practical limitations made it necessary to collect cultural data on a relatively small number of topics, but those which were selected for study were those which seemed likely to be most important as an aid to interpreting the test data and also as indication of the other information which should ultimately be collected during the following years of the study.*

---

[3] Peterson. op. cit. p. 27.

However, the present study was concerned chiefly with finding an answer to the question: How well are Indian children educated? This basic question was broken down into several specific questions as follows:

1. Is the educational achievement of Indian children in some geographic areas greater than in others?

2. Is the educational achievement of Indian children in some types of schools greater than in others?

3. Is the educational achievement of Indian children in the various types of schools they attend, as great as that of non-Indian children in rural public schools?

4. What factors are in operation to produce differences in achievement of Indian children in the different areas, in different types of schools, and in contrast to non-Indian children in public schools?

5. The superior performance of fourth grade Indian children on the 1946 tests, led to the tentative conclusion that the more systematically organized program of instruction keyed to Indian needs, accounted in large part for this clear-cut superiority, and raised the question as to whether these same pupils at the eighth grade level would also show an achievement superior to that of previous eighth graders who had not had the benefit of basic instruction under the new Indian school educational program. Therefore, the following question: On tests common to both the eighth and twelfth grades, what is the percentage of overlap or what percentage of the students in the eighth grade exceeded the mean of the twelfth grade?

COMPOSITION OF TYPES OF SCHOOLS BY AREAS

Many of the comparisons which follow later in Chapter 3 will be more meaningful if one knows the areas represented in the 1950 testing program. Table 2 shows the composition of the types of schools by areas for the students in grades eight and twelve in this study. For example, a large proportion of the students in the eighth and twelfth grades who attended Government reservation boarding schools lived in the Dakota, Pueblo, and Oklahoma areas. A majority of the Indian children in the eighth grade in this study who attended public schools lived in the Mountain and Pacific areas.

CULTURAL BACKGROUNDS OF THE STUDENTS

● Degree of Indian Blood

Table 3 describes the degree of Indian blood of the students in the two grade levels in the different types of schools. The Peterson report also listed the degree of Indian blood according to the

TABLE 2

COMPOSITION OF TYPES OF SCHOOLS BY AREAS FOR TWO GRADE LEVELS

TYPE:	Day Per Cent		Mission Per Cent		Nonreservation Boarding Per Cent		Public Per Cent		Reservation Boarding Per Cent		Totals	
Grade:	8	12	8	12	8	12	8	12	8	12	8	12
AREA:												
Alaska	12.6	...	...	...	32.5	10.9	11.4	2.6	....	....	141	42
Dakota	39.6	73.3	42.3	48.0	1.5	12.8	11.8	12.0	23.9	26.3	230	141
Mountain	5.9	...	...	...	...	...	25.2	19.7	5.3	2.8	89	28
Navajo	...	...	28.2	48.0	...	...	3.9	16.2	7.7	8.9	55	47
Oklahoma	...	...	...	...	21.6	57.6	0.4	28.2	29.2	17.3	158	271
Pacific	...	...	...	...	23.5	11.7	30.4	10.2	2.9	...	143	54
Pueblo	14.9	26.7	1.4	...	...	...	13.9	11.1	18.6	37.4	129	88
Southeast	...	...	...	...	...	...	...	...	5.9	6.7	20	12
Southwest	27.0	...	28.1	4.0	20.9	7.0	3.0	...	6.5	0.6	165	9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1130	692

TABLE 3

PERCENTAGE OF STUDENTS HAVING VARIOUS DEGREES OF INDIAN BLOOD FOR TWO GRADE LEVELS

Degree:	Full		7/8		3/4		1/2		1/4		Some		Eskimo		Totals	
Grade:	8	12	8	12	8	12	8	12	8	12	8	12	8	12	8	12
TYPE OF SCHOOL:																
Day School	61	67	1	..	6	..	22	30	10	3	..	..	..	..	222	30
Mission School	59	44	7	..	4	24	20	8	10	24	..	..	..	..	71	25
Nonreservation Boarding	51	46	3	7	14	16	18	21	4	8	..	..	10	2	268	79
Public School	41	46	6	3	12	10	22	15	18	22	1	4	..	..	230	117
Reservation Boarding	64	64	6	3	14	7	11	11	4	13	1	2	..	..	339	179

different geographic areas. This information was also obtained for this report but since the data were essentially the same as in the 1946 study, they were not recorded here. The same was true of the information gathered on other factors considered in this chapter and therefore it has not been included in this report.

Essentially the same generalizations were obtained with regard to the degree of Indian blood as in the 1946 report,[4] namely:

(1) Nearly all of the students in the Navajo, Pueblo and other Southwest schools are fullblood Indians.

(2) There is a larger percentage of mixedblood students in the nonreservation schools than in any of the other types of Federal Indian schools.

(3) The public schools and mission schools selected for comparison have a fairly wide range of students, extending from the fullblood Indians to all-white students.

Since this report is concerned essentially with comparisons of achievement of Indian children in the various types of schools they attended, the third generalization listed above is important. If the public schools and the mission schools selected had contained only fullblood Indians, it would have been difficult to compare the achievement of the Indian children in these schools with the Indian children in government schools where the degree of Indian blood ranged from fullblood to some Indian blood. This is assuming that the degree of Indian blood is a factor in school achievement. The evidence presented in the 1946 study with regard to this question was inconclusive.

● Education of Parents

Table 4 indicates the average years of school attendance of parents of children enrolled in the fourth grade in the 1946 report and the eighth grade in this report. The educational attendance of the parents of the students in the twelfth grade in 1950 was not available. Peterson concluded that the "students coming from homes in which parents have had the advantage of considerable education, tend to remain in school longer than those coming from homes where the parents have had little or no schooling."[5] Table 4 neither confirms nor denies Peterson's conclusion. However, the parents of Indian children enrolled in the public schools had the highest average years of school attendance when compared with parents of Indian children enrolled in the other four types of schools.

---

[4] Peterson. **op. cit.** p. 29.
[5] Peterson. **op. cit.** p. 30.

TABLE 4
AVERAGE YEARS OF SCHOOL ATTENDANCE OF PARENTS OF CHILDREN ENROLLED IN GRADE FOUR IN 1946 AND IN GRADE EIGHT IN 1950

Year:	1946		1950	
Grade:	Four		Eight	
	Father	Mother	Father	Mother
TYPE OF SCHOOL:				
Day	5.5	5.7	5.0	5.2
Mission	6.3	6.4	7.4	6.3
Nonreservation Boarding	6.4	6.3	6.7	6.3
Public	7.3	7.9	7.6	7.4
Reservation Boarding	4.2	4.0	6.6	6.9

A study of drop-outs in the Lawrence Junior High School, Lawrence, Kansas,[6] revealed that the average school grade reached by the mothers was 8.1 and that reached by the fathers was 7.7. Both of these values are higher than those listed for the Indian children in grade eight in Table 4. The average school grade reached by the parents of all junior high school students in the Lawrence school would be much higher.

In a study of a representative group of North Central High Schools in Kansas, about eighty-eight per cent of the adults, in the communities in which these schools were located, had completed the elementary school or higher.[7]

Any conclusions, therefore, regarding the achievement of Indian students in the various schools and white students in public schools should be tempered by the fact that the educational level reached by the parents of Indian children is probably considerably less than that reached by the parents of white children in public schools.

● Language Spoken in the Home

Table 5 describes the pre-school language usually spoken by the eighth and twelfth grade Indian students in the 1950 study. Peterson had this to say about the language spoken in the homes of Indian children in the 1946 study:[8]

It should be noted that this represents the language which the student reported as that which is actually spoken in the home—not the homes in which one or both parents can talk and understand

---

[6] **Review and Preview, Secondary School Studies of Drop-Outs, Hidden Tuition Costs, Junior High Activity Program.** Lawrence Junior High School, Liberty Memorial High School, Lawrence, Kansas. (In cooperation with the School of Education, University of Kansas.) 1950-51.

[7] Kenneth F. Anderson. **A Summary Report to the North Central Schools of Kansas on Criterion I.** (Mimeographed Bulletin) School of Education, University of Kansas, 1949. p. 16.

[8] Peterson. **op. cit.** pp. 31-32

enough English to converse in that language if necessary. There is evidence that many students who, because they speak English habitually around school and are thought of as English-speaking, actually speak only Indian when they are at home. It is also apparent that many adult Indians who speak perfectly good English when necessary, elect to converse in their Indian language at home. It will be noted that the students in day schools come from homes in which less English is spoken than do the students in any of the other types of Indian schools. As would be expected, the public school children have by far the greatest amount of English spoken in their homes. This is true for Indian students in public schools, as well as for whites in public schools. A much greater proportion of English is spoken in the homes of the twelfth grade students in Indian schools, and the proportion for the eighth grade is greater than that for the fourth grade. The language spoken in the home appears to be correlated with school achievement and also with the number of years the student remains in school.

Although the information was not available, observations have indicated that English was the predominant language spoken in the homes of white children in the public schools in this study. Therefore, any conclusions regarding the achievement of Indian students in the various schools and white students in public schools should be tempered by this fact.

TABLE 5

PERCENTAGE OF INDIAN STUDENTS USUALLY SPEAKING THE PRE-SCHOOL LANGUAGE INDICATED

Language:	English		Indian		English and Indian		Other	
Grade:	8	12	8	12	8	12	8	12
TYPE OF SCHOOL:								
Day	36	36	25	41	37	23	2	.
Mission	41	51	40	14	18	35	.	.
Nonreservation Boarding	38	52	10	12	42	33	9	2
Public	67	67	3	8	24	21	6	4
Reservation Boarding	42	31	21	27	36	42	.	.

● Home Stability

Table 6 describes the home stability of the students in the eighth grade by indicating the percentage living with their parents, with only their father, with only their mother, with relatives, or with others. Data for the twelfth grade were not available. The following statement appeared in the 1946 study:[*]

---

[*] Peterson. op. cit. pp. 33-34

These data do not appear to have a direct or easily interpretable relationship with any of the achievement scores, or with home factors studied, but they will probably prove of value and interest in personnel and adjustment studies. For example, the percentage of students living with both parents is much smaller among students in nonreservation boarding schools than in any other type of school. The data do not indicate, of course, that the broken home is never a factor in the poor achievement of an individual student, but they do indicate that, whatever the adverse effects of a broken home may have been among these students, they are concealed by other factors more directly affecting achievement.*

**Dependency because of a broken home is one criterion for admission to a nonreservation boarding school.*

TABLE 6
PERCENTAGE OF INDIAN STUDENTS IN EIGHTH GRADE IN 1950 LIVING WITH BOTH PARENTS, ONE PARENT, RELATIVES OR OTHERS*

Living:	With Parents	With Father	With Mother	With Relatives	With Others
TYPE OF SCHOOL:					
Day	88.1	3.3	4.6	1.3	2.6
Mission	87.5	6.3	3.1	. .	3.1
Nonreservation Boarding	58.4	10.8	20.0	7.7	3.1
Public	90.6	. .	1.6	7.8	. .
Reservation Boarding	70.7	7.3	13.4	8.5	. .

*These data were obtained from the 1946 background sheets for the students in this study in 1950. It is not supposed that conditions were too much different in 1950 for these same students.

The important thing to note in Table 6 is that the percentage of students falling into the various categories did not differ too widely in the various types of school which these Indian children attended. If home stability is a factor in school achievement, the students who attended the nonreservation schools should not have achieved as much as students who attended the other types of schools. Although the data were not available, observations indicate that a greater percentage of the white children in the public schools in this study lived with their parents than was true of the Indian children in the various schools. This factor must be considered when comparing the achievement of Indian children in the various schools and white children in the public schools.

● Permanent Residence

Table 7 indicates the percentage of students in the various types of schools living in urban centers of 500 or more population. The Indian children enrolled in the nonreservation boarding schools and in the public schools lived in population centers more urban than the Indian children who attended the other types of schools. A much greater percentage of the white children in public schools in this study lived in urban centers than was true of Indian children in any of the types of schools they attended. Certain cultural advantages are open to youngsters living in urban centers that are not available to those living in rural areas. It would be expected that Indian children living in urban centers might assimilate the white man's culture more rapidly than Indian children living in rural areas. Any conclusions, therefore, regarding the achievement of Indian children and white children in public schools should take the facts revealed in Table 7 into consideration.

TABLE 7
PERCENTAGE OF STUDENTS LIVING IN CENTERS OF 500 OR MORE POPULATION

	Grade Eight Per Cent	Grade Twelve Per Cent
TYPE OF SCHOOL:		
Day*	4.6	3.3
Mission*	8.4	4.0
Nonreservation Boarding*	23.8	21.7
Public Schools*	14.4	7.8
Reservation Boarding*	8.3	7.2
All Indians	12.4	17.0
Whites in Public Schools	45.0	30.2

*Indian students.

● Kinds of Friends

Table 8 reveals percentages of the kinds of friends of Indian children who attend the various schools for Indians and the kinds of friends of white children who attend the public schools included in this study. If contact with white children is a factor in school achievement, then the Indian children attending the public schools should achieve more than the Indian children attending the other types of schools for Indian children. The Indian children in the twelfth grade in this study apparently have more contact with white children. Therefore, if contact with white children is a factor in school achievement, then the Indian students in the upper grades should compare more favorably with white children in school achievement than the Indian children in the lower grades.

TABLE 8
KINDS OF FRIENDS BY TYPE OF SCHOOL FOR TWO GRADE LEVELS

	All Indian Per Cent		Mostly Ind. Some Wh. Per Cent		Mostly Wh. Some Ind. Per Cent		All White Per Cent		Total **	
Grade:	8	12	8	12	8	12	8	12	8	12
TYPE OF SCHOOL:										
Day*	33.3	26.7	59.0	70.0	5.9	...	...	...	222	30
Mission*	31.0	4.0	64.8	84.0	2.8	12.0	...	...	71	25
Nonreservation Boarding*	27.6	8.1	64.2	74.7	6.0	14.5	...	1.4	268	359
Public Schools*	5.7	1.7	65.7	53.0	22.2	39.3	1.3	3.4	230	117
Reservation Boarding*	19.8	25.7	74.6	68.2	4.1	3.9	0.3	0.6	339	179
All Indians	22.1	12.1	66.6	69.6	8.5	15.2	0.4	1.4	1130	710
Whites in Public Schools		00.6	7.6	3.5	72.9	74.4	15.3	18.6	484	172

*Indian students. **Includes some children for whom data were not available.

EDUCATIONAL CHARACTERISTICS OF THE STUDENTS

● Grade Placement and School Attendance

Table 9 shows the average age of the students in grades eight and twelve in the 1950 study. These values are almost identical with those given in the 1946 study. However, the percentages of students accelerated in the eighth and twelfth grades in 1946 were 4.5 per cent and 15.9 per cent respectively,[10] as contrasted to 9.5 per cent and 17.3 per cent respectively in the 1950 study. However, the gain in acceleration in the eighth grade was offset by an increase in retardation, the percentage of retardation being 6.8 per cent in 1946 as contrasted to 13.2 per cent in 1950. In the twelfth grade in 1950, there was an increase in the percentage of students accelerated and in the expected age group and a decrease in the percentage of students retarded when compared with the values

TABLE 9
AGE OF STUDENTS IN RELATION TO GRADE PLACEMENT

		Type of School			
		Indian Schools	Indians in Public Schools	Whites in Public Schools	Mission Schools
Average Age of Students	Grade 8	15.2	14.5	13.9	14.9
	Grade 12	18.8	18.4	17.6	18.7

	Accelerated*	Exp. Age Group*	Retarded*
Grade 8	Below 13.5 years 9.5%	13.5-16.5 yrs. 77.3%	over 16.5 13.2%
Grade 12	Below 17.5 years 17.3%	17.5-20.5 yrs. 73.6%	over 20.5 9.1%

*Indian students.

---

[10] Peterson, op. cit. p. 34.

given in the 1946 study. Whether or not this trend represents a change in promotional policy or a dropping out of less capable students was not revealed by the information gathered.

Table 10 indicates the number of years of school attendance in relation to grade placement. The average number of years of school attendance was almost identical with that reported in the 1946 study.[11] Here again the comparison with regard to accelerated, regularly promoted, and retarded students is almost the same as mentioned previously with regard to Table 9.

TABLE 10
NUMBER OF YEARS OF SCHOOL ATTENDANCE IN RELATION TO GRADE PLACEMENT

		Type of School			
		Indian Schools	Indians in Public Schools	Whites in Public Schools	Mission Schools
Average Number Years of School Attendance	Grade 8	8.5	8.4	8.4	8.6
	Grade 12	12.2	12.1	12.0	12.2

	Accelerated*	Reg. Promoted*	Retarded*
	Attended School Fewer than 8 Years	Attended School 8-9 Years	Attended School 10 Years or More
Grade 8	9.1%	78.9%	12.0%
	Attended School Fewer than 12 Years	Attended School 12-13 Years	Attended School 14 Years or More
Grade 12	11.7%	84.2%	4.1%

*Indian students.

In a study of a group of Kansas North Central high schools,[12] the percentage of over-ageness decreased from grades nine to twelve, while the percentage of youngness increased. This trend noted in Tables 9 and 10 for Indian children is typical of white children in the public schools. The decrease in the percentage of retarded students in the upper grades may be partially explained by acceleration during the interval or because more of the students now entering have difficulties that result in early retardation.

The percentage of students in the twelfth grade in the Kansas North Central high schools who were older than 17.5 years, was 17.6 per cent. The percentage of students in the twelfth grade in the Indian schools in this study who were over 17.5 years was 82.8 per cent. Thus, it is apparent that the Indian students in the twelfth grade in this study were considerably retarded when compared with white students in typical public high schools. There are many reasons for this retardation, the chief one probably being the late entrance of many Indian students in school. Thus, any conclusions regarding the achievement of Indian students in the various schools with white children in public schools must be tempered by differences in the ages of students in relation to their grade placement.

---

[11] Peterson. **op. cit.** p. 34.

[12] Kenneth E. Anderson. **A Summary Report to the North Central Schools of Kansas on Criterion I,** p. 13.

●Size of School Attended

Table 11 presents some information regarding size of school attended by Indian children, and white children in public schools. The number of cases for grade twelve for white children in public schools was far too few to make a comparison. Two studies[13], [14] have shown the size of the school to be a factor in school achievement. These studies demonstrated that students in schools of less than 100 pupils did not achieve as much in certain subjects as pupils in schools enrolling from 100 to 500 students. Whether or not this factor played a role in this present study is not known, but it might well have affected the Indian students.

TABLE 11

SIZE OF SCHOOL ATTENDED BY CHILDREN IN GRADE EIGHT

	Less than 200 pupils Per Cent	Over 200 pupils Per Cent
Indian Children	24.6	75.4
White Children	11.4	88.6

●School Attendance

Table 12 shows the median number of days attended by Indian children in the various schools and by white children in public schools. Table 13 gives the percentage of Indian children in the various schools and white children in public schools that attended from 155 to 184 days. It is apparent from these two tables that Indian children in the nonreservation boarding schools have the best record of attendance while the Indian children in the day schools have the poorest record of attendance. However, the attendance figures as given here for Indian children compare favorably with those of white children in the public schools in this study. If attendance is a factor in school achievement, then Indian children attending nonreservation boarding schools should achieve the most and Indian children attending day schools should achieve the least. This is merely an interesting hypothesis, which might be explored in a study planned to test out the hvpothesis.

---

[13] Kenneth E. Anderson. "A Frontal Attack on the Basic Problem in Evaluation." **Journal of Experimental Education,** 18 (March 1950) 163-174.

[14] Jim Schunert. "The Association of Mathematical Achievement with Certain Factors Resident in the Teacher, in the Teaching, in the Pupil and in the School." **Journal of Experimental Education,** 19 (March 1951) 219-238.

TABLE 12
MEDIAN NUMBER OF DAYS ATTENDED BY CHILDREN FOR TWO GRADE LEVELS

Grade:	Eight		Twelve	
	N	Md.	N	Md.
TYPE OF SCHOOL:				
Day	218	164	30	163
Mission	70	171	25	184
Nonreservation Boarding	261	177	359	188
Indians in Public Schools	197	168	83	172
Reservation Boarding	314	174	170	177
All Indians	1062	172	673	183
Whites in Public Schools	428	170	154	182

TABLE 13
PERCENTAGE OF STUDENTS ATTENDING FROM 155 TO 184 DAYS FOR TWO GRADE LEVELS

	Grade Eight	Grade Twelve
TYPE OF SCHOOL:		
Day	63.5	66.7
Mission	73.3*	100.0
Nonreservation Boarding	94.5	98.5
Indians in Public Schools	70.0	64.1
Reservation Boarding	76.9	93.8
All Indians	77.6	90.3
Whites in Public Schools	74.5	81.5

*A majority of these Indian children attended more than 184 days. About 27 per cent of these children attended school from 225 to 234 days.

● Males and Females Enrolled

Table 14 indicates the percentage of male and female Indian children enrolled in the various schools and the percentage of male and female white children enrolled in the public schools in this study. These figures would seem to indicate that the schools which Indian children attend are holding more girls than boys in school. This trend is more evident with regard to white children in the public schools. The latest enrollment figures for the nation show that about 430,000 more girls than boys go to high school, despite the fact that there are more boys than girls of high school age.[15]

---

[15] Ellsworth Tompkins. "Where Are the Boys?" **School and Society**, 70 (July 2, 1949) 8-10.

TABLE 14
PERCENTAGE OF MALES AND FEMALES BY TYPES OF SCHOOLS FOR TWO GRADE LEVELS

	Grade Eight			Grade Twelve		
	Per Cent		Total	Per Cent		Total
	Male	Female	Number	Male	Female	Number
TYPE OF SCHOOL:						
Day	52.3	47.7	222	70.0	30.0	30
Mission	45.1	54.9	71	36.0	64.0	25
Nonreservation Boarding	39.7	60.3	267	46.5	53.5	359
Indians in Public Schools	48.3	51.7	230	44.4	55.6	117
Reservation Boarding . .	48.2	51.8	338	48.0	52.0	179
Whites in Public Schools	47.9	52.1	484	39.0	61.0	172

● Academic Ambition

Table 15 indicates the percentage of students desiring to complete the various grades or courses. The same kind of information was not available for the white children in the public schools in this study, but it would be supposed that the academic ambition of the white children would be higher than that of the Indian children. Furthermore, it would be supposed that academic ambition would be a factor in school achievement. Whether or not this factor played a role in this study is not known.

TABLE 15
PERCENTAGE OF INDIAN STUDENTS DESIRING TO COMPLETE THE VARIOUS GRADES OR COURSES

Students hoped to complete:	Grade 8		Grade 12		Trade School		College	
	Per Cent		Per Cent		Per Cent		Per Cent	
Students now in Grade:	8	12	8	12	8	12	8	12
TYPE OF SCHOOL:								
Day	6.4	. .	77.3	26.3	. .	47.4	16.3	26.3
Mission	14.5	. .	85.5	30.8	. .	28.2	. .	41.0
Nonreservation Boarding.	2.9	. .	93.9	36.7	0.4	46.9	2.8	16.3
Public	1.0	. .	87.6	27.9	3.3	40.5	8.1	31.5
Reservation Boarding . . .	2.4	. .	82.3	33.7	0.9	43.1	14.3	23.2

SUMMARY

A number of factors seemingly related to school achievement have been cited and discussed. If these factors affected school achievement as measured in this study, they did so to produce differences in achievement:

(1) among Indian children attending the different types of schools or living in different geographic areas, and

(2) of Indian children when contrasted to white children in public schools.

These factors and many more, tend to operate in two directions. This complicates rather than simplifies the problem of answering the question, how well are Indian children educated?

Some of the factors discussed operate in varying degrees of intensity on different groups of Indian children to produce less school achievement than that attained by white children in the public schools. Some of these factors are: degree of Indian blood, language spoken in the home, home stability, place of residence, kinds of friends, late entrance to school, size of school attended, regularity of school attendance, and academic ambition. Any conclusions, therefore, regarding the school achievement of Indian children as contrasted to the school achievement of white children in public schools must be tempered by the fact that these factors may tend to operate against Indian children. Some may argue that the influence of some of these factors on school achievement has not been definitely established. Until research proves differently, we can only be mindful of the differences in the cultural and educational backgrounds of Indian children as contrasted to white children in public schools.

Chapter III

Statistical Treatment Of The Test Data

INTRODUCTION

In order to make the report more meaningful to the reader, it was decided to describe the statistical treatment of the test data in some detail. The discussion and interpretation of the results depend directly upon this treatment. Then too, because of the great amount of data gathered, certain assumptions had to be made in order to facilitate the treatment of the data and the discussion of the results. An understanding of these assumptions is necessary to interpret and qualify the results properly.

GENERAL PROCEDURES

The test scores for each test for each student were entered on a code sheet, transferred to Hollerith cards, and sorted by IBM equipment. Since there were nine geographic areas and six types of schools and twenty-four tests, the sorting yielded 360 distributions. The following distribution for grade eight for day schools for the **Pressey Vocabulary Test** was typical:

Class Interval	f	x	fx	fx^2
90-99				
80-89	4	4	16	64
70-79	17	3	51	153
60-69	32	2	64	128
50-59	68	1	68	68
40-49	51		+199	
30-39	29	—1	—29	29
20-29	14	—2	—28	56
10-19	2	—3	—6	18
	217		—63	516

The following values were calculated for each of the 360 distributions: (1) mean, (2) standard deviation, (3) plus one standard deviation, and (4) minus one standard deviation. For the distribution shown above, the calculations were as follows:

$$\text{Mean} = 44.5 + \frac{10(136)}{217} = 50.77$$

$$\text{Standard deviation} = 10\sqrt{\frac{516}{217} - \frac{(136)^2}{(217)^2}} = 14.09$$

$$\text{Plus one standard deviation} = 50.77 + 14.09 = 64.86$$
$$\text{Minus one standard deviation} = 50.77 - 14.09 = 36.68$$

These values were used to draw the vertical lines which appear on the twenty-four figures in Chapter IV. There are nine of these lines for the nine geographic areas and six of these lines for the six types of schools.

These values were also used in computing the percentage of overlap between grade eight and grade twelve for the various types of schools where the tests given were common to both grade levels. For example, what percentage of the students in the mission schools in grade eight exceeded the mean of the students in the mission schools in grade twelve on the **Use of Resources Test**? The mean of the pupils in grade twelve was 47.45 and the mean for the pupils in the eighth grade was 37.91. The standard deviation for the eighth grade was 8.40. In terms of the eighth grade distribution, how many standard deviations above the mean would a score of 47.45 fall? The procedure is as follows:

$$\frac{47.45 - 37.91}{8.40} = 1.14$$

Assuming a normal distribution of test scores for grade eight, 1.14 standard deviations above the mean would have 12.7 per cent of the area above this point. Therefore, it can be said, assuming a normal distribution of scores, that 12.7 per cent of the eighth grade exceeded the mean score of the twelfth grade on the **Use of Resources Test.**

FURTHER ANALYSIS

Did the Indian children located in a particular geographic area achieve significantly more on a particular test than the Indian children in the other eight areas? In order to answer this question for the twenty-four tests, it would have been necessary to run twenty-four tests of significance by means of the technique of analysis of variance. Since this technique is based on the assumption of homogeneity of variances, this would have necessitated twenty-four tests for homogeneity of variances prior to the application of the F test or test of significance. If on a particular test, the geographic areas had been homogeneous with respect to variances and if the F test had proved to be significant, thirty-six **t** tests would have had to be run in order to locate the significant differences between particular geographic areas. The required probability for the selected difference to be significant would be 1.39 in 1000 at the 5 per cent level or the critical ratio would have to be equal to or greater than about 3.22. Even a spot check here and there would, at best, be sketchy because the number of cases in each area varies considerably. Thus, in two different comparisons the one critical ratio might be significant because of the large N's involved and the other critical ratio might not be significant because of the small N's involved, even though the differences in means were the same or nearly so. Needless to say, these calculations would have involved an immense amount of labor. Therefore, any conclusions regarding differences in achievement between geographic areas on the various tests, will have to be drawn from the line graphs appearing in the various figures.

A word of explanation regarding the line graphs is in order. The distribution for a particular test for a particular area or type of school is graphically portrayed by a straight vertical line, the lowest point of the line being one standard deviation below the mean (a horizontal mark at the center of the vertical line), and the highest point of the line being one standard deviation above the mean. These limits, assuming a normal distribution of scores, mark the range of the middle two-thirds of the students on a particular test. The achievement of Indian children in the various geographic areas or in the various types of schools can be compared by locating the mean point. In addition, the amount of overlap in achievement on a particular test can be noted by comparing the two vertical lines for two geographic areas or for two types of schools.

These vertical lines were also drawn for the five types of schools which Indian children attend. These five types of schools are: reservation boarding schools, day schools, mission schools, nonreservation boarding schools, and public schools.* Since the Indian Service is more interested in the achievement of Indian children in the various schools Indian children attend than in the comparison between these types of schools and the schools which white children attend, it was decided to go beyond the graphical treatment for these comparisons even though the amount of labor involved was great.

Since the results of the IBM work yielded distributions of scores rather than the sums of the scores and the sums of the scores squared, it would have been awkward to use the technique of analysis of variance mentioned previously. An examination of the line

---

*Indian children in the public schools will in this report be called **Public Indian.** White children in the public schools will be called **Public White.**

graphs made it almost certain that significant differences based on comparisons between types of schools would have been obtained for all twenty-four of the tests. Later calculations proved this examination to be correct. For the moment, let us assume that F values had been calculated and that all of the values were significant. Ordinarily one would not calculate the F values unless the test of homogeneity of variances had established that the variabilities of the groups under comparison were essentially the same. Were the variabilities for the six types of schools on the twenty-four tests essentially the same or did they differ significantly from each other? An examination of the data indicated that on some of the tests, the six types of schools were homogeneous with respect to variances and on other tests they were not. What effect would a significant difference in variances have on the value obtained by running a **t** test on the scores obtained from the two types of schools? It may result in a somewhat larger value of **t**, but it is unlikely that a significant value of **t** would be produced only by a difference in variances.[16] Since the data yielded by the IBM work lent themselves better to the calculation of critical ratios rather than **t** ratios, fifteen critical ratios were calculated for each of the twenty-four tests. A comparison was made of the values yielded by the critical ratio formula with those yielded by the **t** formula or by the use of the Behrens-Fisher formula when the variances were not homogeneous.

In the case of the **Pressey Vocabulary Test** for grade eight, did the Indian children in the public schools achieve significantly more than the Indian children in the day schools? A critical ratio of 5.81 was obtained in favor of the Indian children in the public schools. On the face of it, this would seem to indicate that Indian children in the public schools achieved significantly more than did the Indian children in the day schools. The application of the **t** test yielded a value of 5.86, slightly higher than that obtained by the critical ratio formula. However, the variances of the two groups were not homogeneous and the **t** test was not the proper tool to use. The application of the Behrens-Fisher **d** test yielded a value of 5.86 which exceeded the table value at the 1 per cent level. This definitely established the superiority of the Indian children in the public schools.

Although the procedure used with the comparison of achievement of Indian children in public and day schools is correct where the variances differ significantly, this procedure involves a great amount of unnecessary work, since the values obtained by all three methods will not differ greatly when the number of cases involved is large. Edwards has this to say: "With still larger samples, in the neighborhood of 30 cases each, a variance which is 2.0 times as large as the other will be sufficient to reject the hypothesis of a common variance."[17] Since the number of cases in grade eight ranged from about 70 to 450 and since the number of cases in grade twelve ranged from about 30 to 350, the consideration of homogeneity of variances for this study did not seem to be important providing the reader is mindful that significant differences in variances did exist in a minority of the comparisons. Therefore, to facilitate the drawing of conclusions, it was assumed that each of the twenty-four sets of comparisons yielded significant F values and that the variances for each set were homogeneous. Thus, the calculation of fifteen critical ratios for each of the twenty-four sets of comparisons would be necessary to ascertain which group or groups achieved significantly more than the others. Since for each comparison there were six types of schools necessitating the calculation of fifteen critical ratios, the required probability for the selected difference to be significant is not 1 in 100 but as 1 in (15) (100), or .6 in 1000 at the 1 per cent level and 3.3 in 1000 at the 5 per cent level. Thus, any critical ratio above 3.40 would have a probability value less than .6 in 1000 and would be considered significant at the 1 per cent level. Any critical ratio from 2.94 to 3.40 would have a probability value less than 3.3 in 1000 and would be considered significant at the 5 per cent level. The twenty-four tables in Chapter IV, each containing fifteen critical ratio values, are to be read with the above discussion and reservations in mind.

---

[16] R. A. Fisher. **Statistical Methods for Research Workers.** (6th ed.) Edinburgh: Oliver and Boyd, 1936. p. 129.

SUMMARY

This chapter has described the general procedures used in the treatment of the test data. Two statistics, the mean and the standard deviation, were calculated for each category for each of the twenty-four tests. These statistics were used in the construction of line graphs showing the range of scores for the middle two-thirds of the students in a particular category on a particular test. It was explained that these line graphs could be used for rough comparisons of achievement of children located in the different geographic areas or in the different types of schools. In addition, the means and standard deviations were used to determine the percentage of Indian children in the eighth grade that exceeded the mean of the Indian children in the twelfth grade where the tests given were common to both grades. Since the comparisons involving Indian children in the various types of schools they attend as well as comparisons with white children in public schools were considered of greater importance than the comparisons between geographic areas, considerable discussion was devoted to the calculation of critical ratios and their interpretation as to significance. It was decided that a critical ratio of 3.40 or greater would be significant at the 1 per cent level and that a critical ratio of 2.94 to 3.40 would be significant at the 5 per cent level. It was pointed out that the above statements are based upon certain assumptions and reservations, and that the reader must be mindful of these assumptions and reservations when considering the data at hand.

---

[17] Allen L. Edwards. **Experimental Design in Psychological Research.** New York: Rinehart and Company, Inc., 1950. p. 163.

Chapter IV

Results Of The Statistical Treatment Of The Test Data

INTRODUCTION

The results of the statistical treatment of the test data* obtained by the administration of twelve tests to the eighth grade and twelve tests to the twelfth grade will be discussed under three headings: (1) comparisons of achievement by means of line graphs for the nine geographic areas and for the six types of schools for grades eight and twelve, (2) comparisons of achievement by means of the percentage of overlap between grades eight and twelve where the tests were common to both grade levels, and (3) comparisons of achievement by means of critical ratios for the types of schools for grades eight and twelve. These three types of comparisons were made in order to provide realistic answers to the basic questions stated in Chapter II.

Achievement of Indian Children in Various Geographic Areas

A spot check here and there revealed significant differences in means. This was particularly true of Alaska when compared with other areas and occasionally true for the Oklahoma, Mountain and Pacific areas when compared with other areas on both the eighth and twelfth grade tests. Thus, the reader must make his own judgment regarding the relative achievement of Indian children in the various areas, keeping in mind the discussion in Chapter III with regard to significant differences in achievement.

- Achievement of Indian Children in the Eighth Grade

Figures 1-12 portray graphically the achievement of Indian children in the eighth grade in the nine geographic areas. The short horizontal line on each line graph indicates the mean score and the length of the line indicates the range of scores for the middle two-thirds of the students. An examination of the figures reveals considerable variation in mean achievement in the various geographic areas, but it also reveals a great amount of overlap in achievement. Even though the Indian children in one geographic area have the highest mean achievement on a particular test, there are children in the other areas that exceed the mean of the area with the highest mean achievement.

---

*Raw or untreated scores.

FIGURE 1

PRESSEY VOCABULARY TEST
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

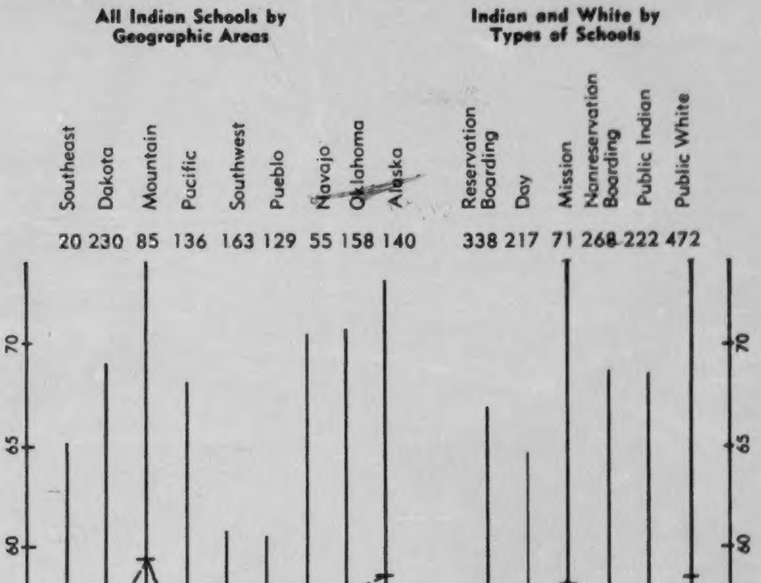


FIGURE 2

GATES BASIC READING TEST—TYPE A
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

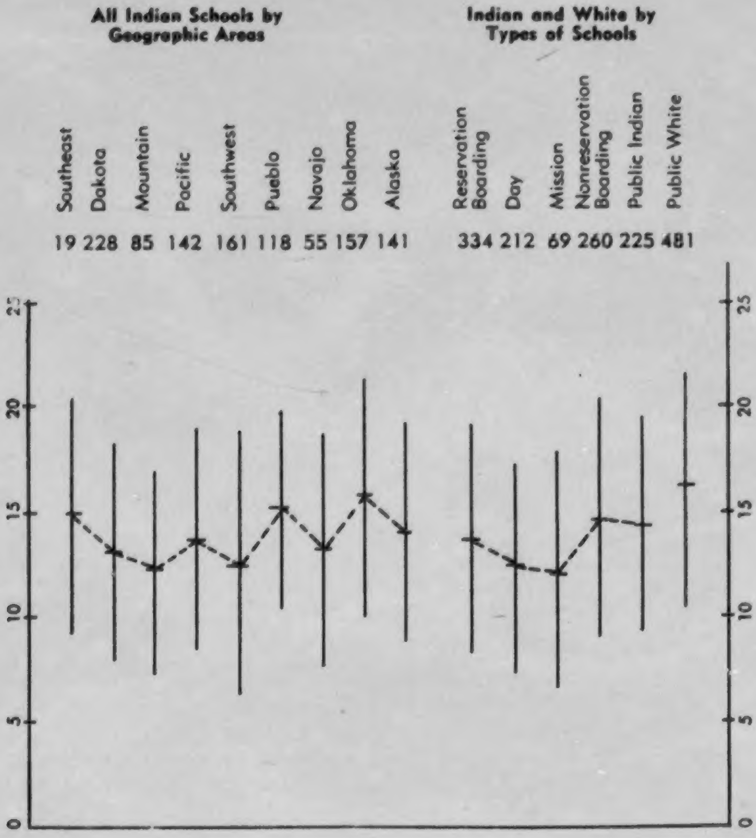


FIGURE 3

GATES BASIC READING TEST—TYPE C
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

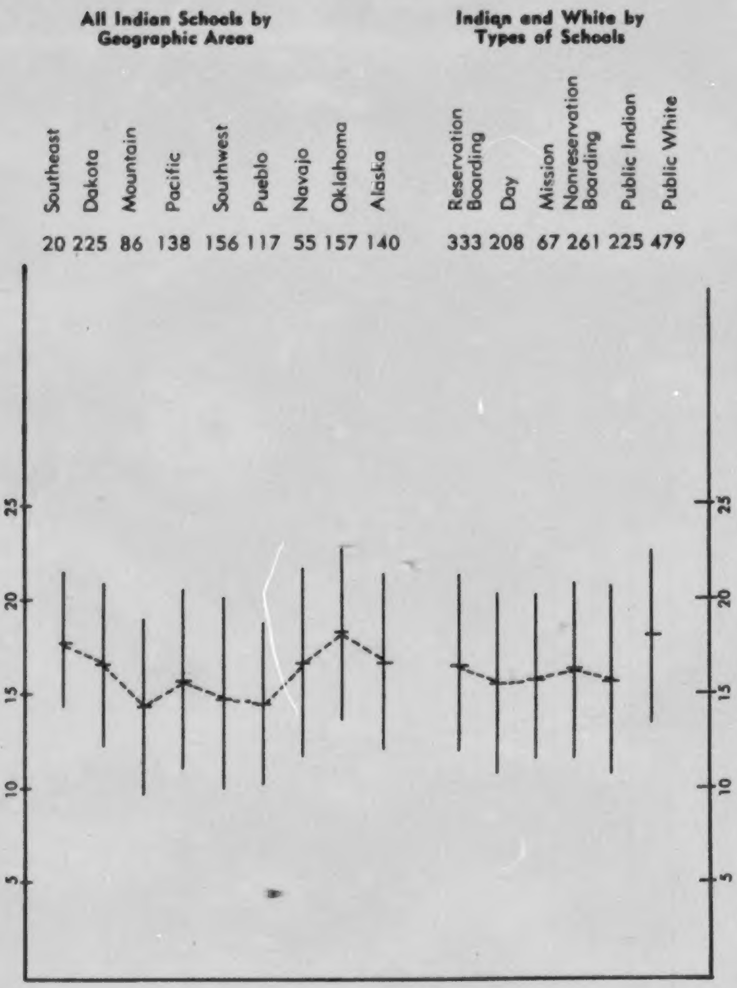


FIGURE 4

PRESSEY ENGLISH TEST—SECTION A
(CAPITALIZATION)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

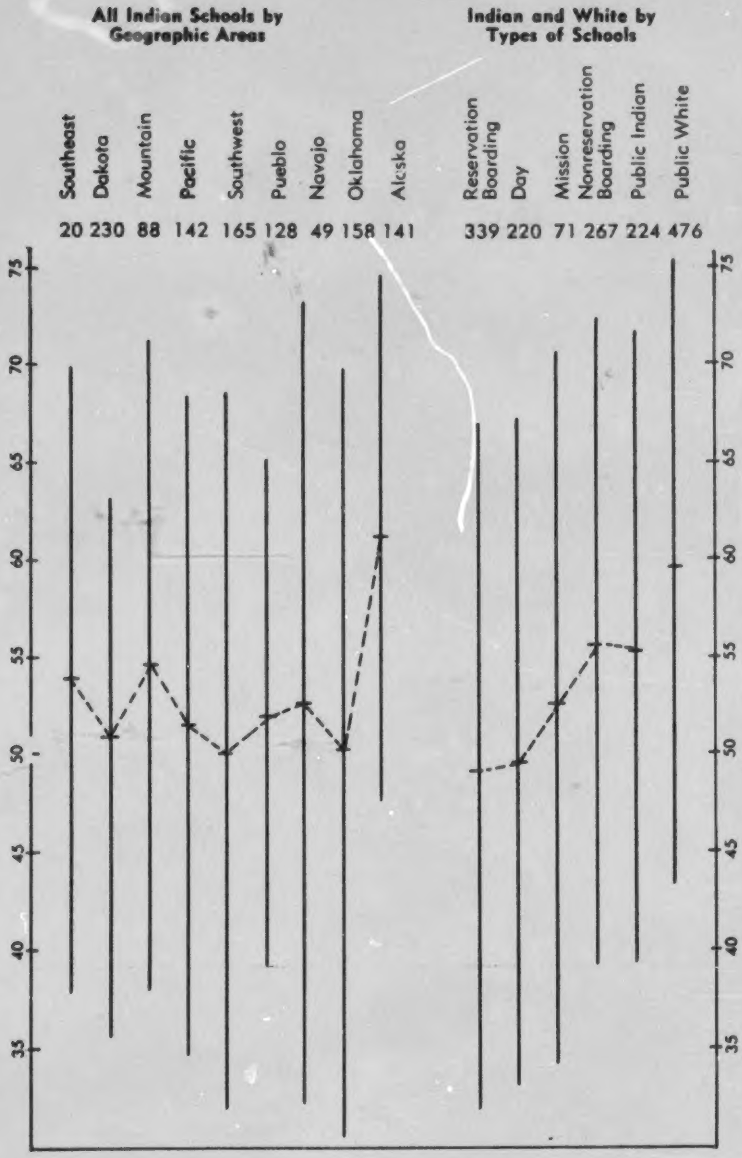


FIGURE 5

PRESSEY ENGLISH TEST—SECTION B (USAGE) MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 8, 1950

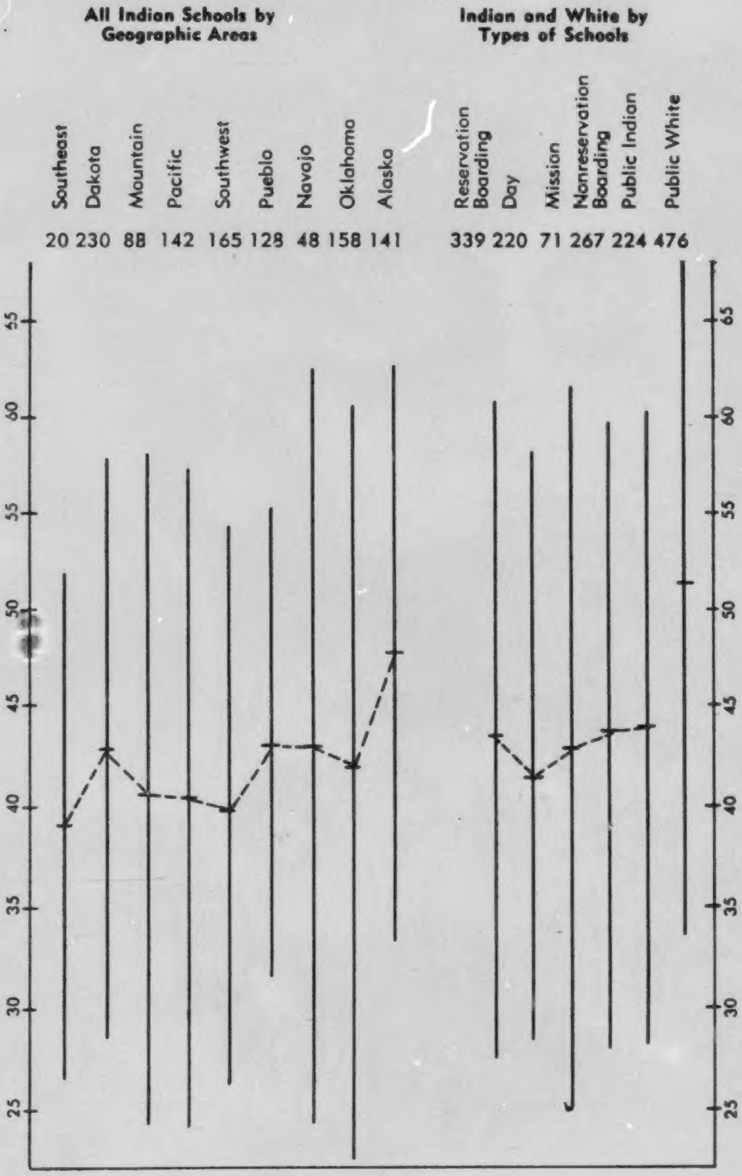


FIGURE 6

PRESSEY ENGLISH TEST—SECTION C (PUNCTUATION) MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 8, 1950

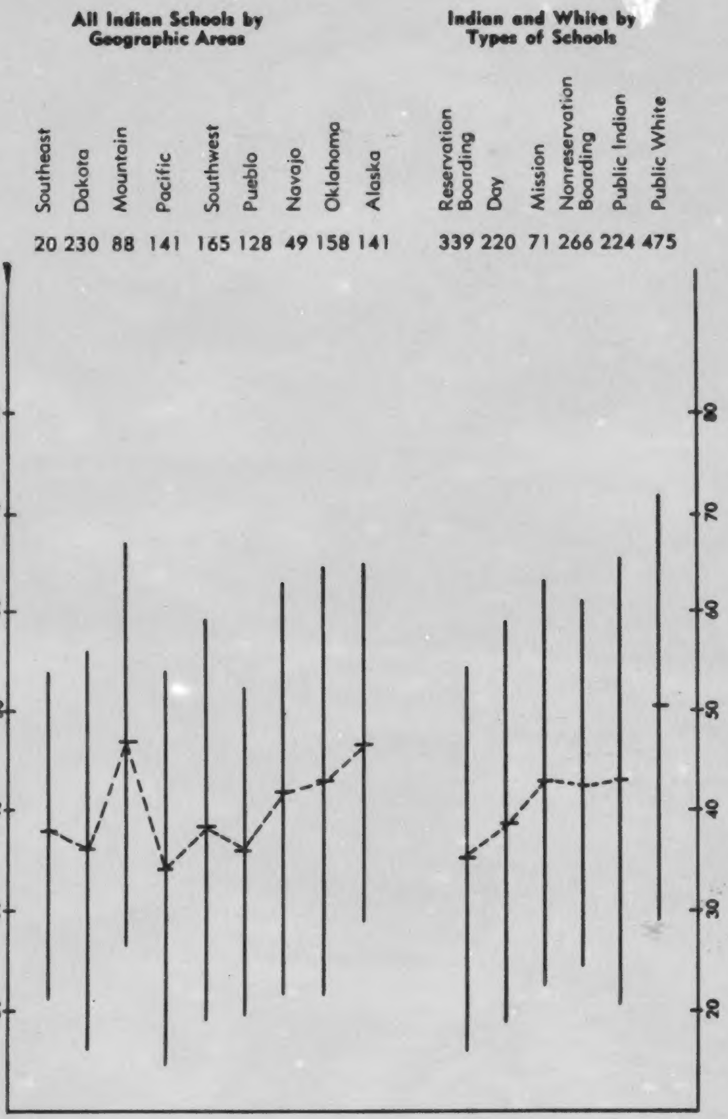


FIGURE 7

PRESSEY ENGLISH TEST—SECTION D
(SENTENCE STRUCTURE)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

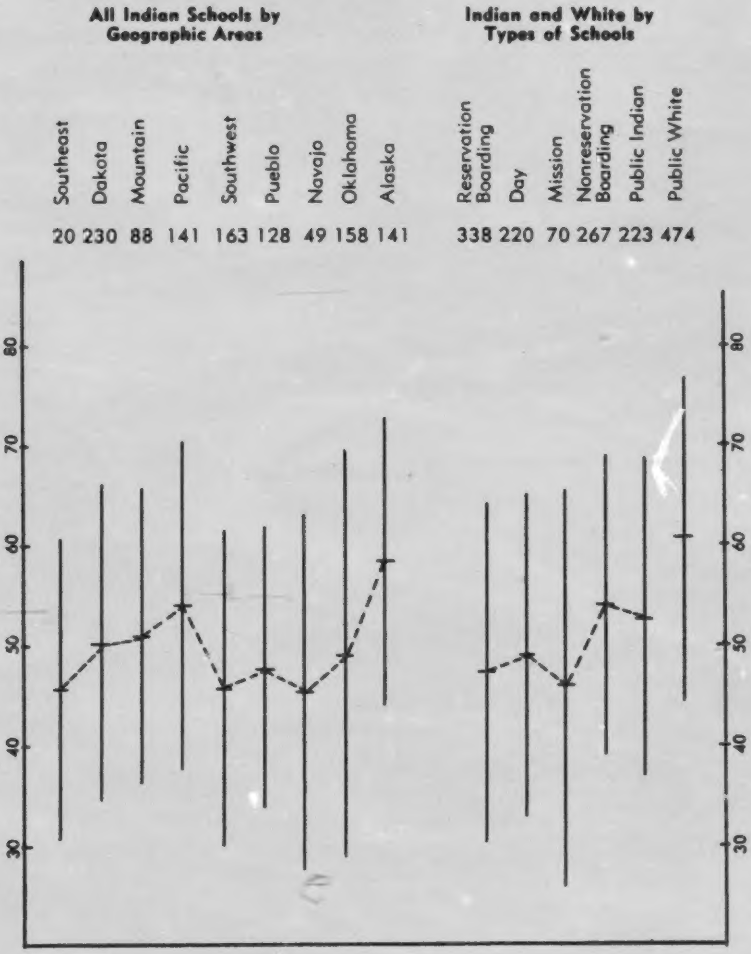


FIGURE 8

UNITED STATES INDIAN BUREAU ARITHMETIC TEST
FACTOR ABILITIES
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

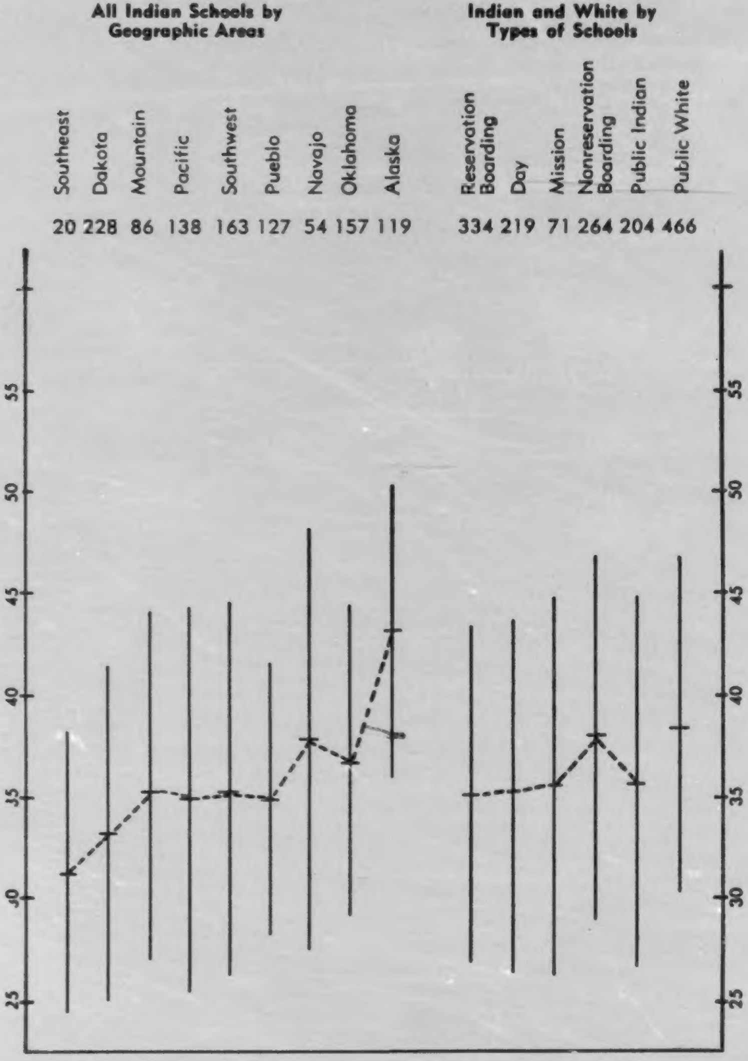


FIGURE 9

ORLEANS ARITHMETIC COMPUTATION TEST
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

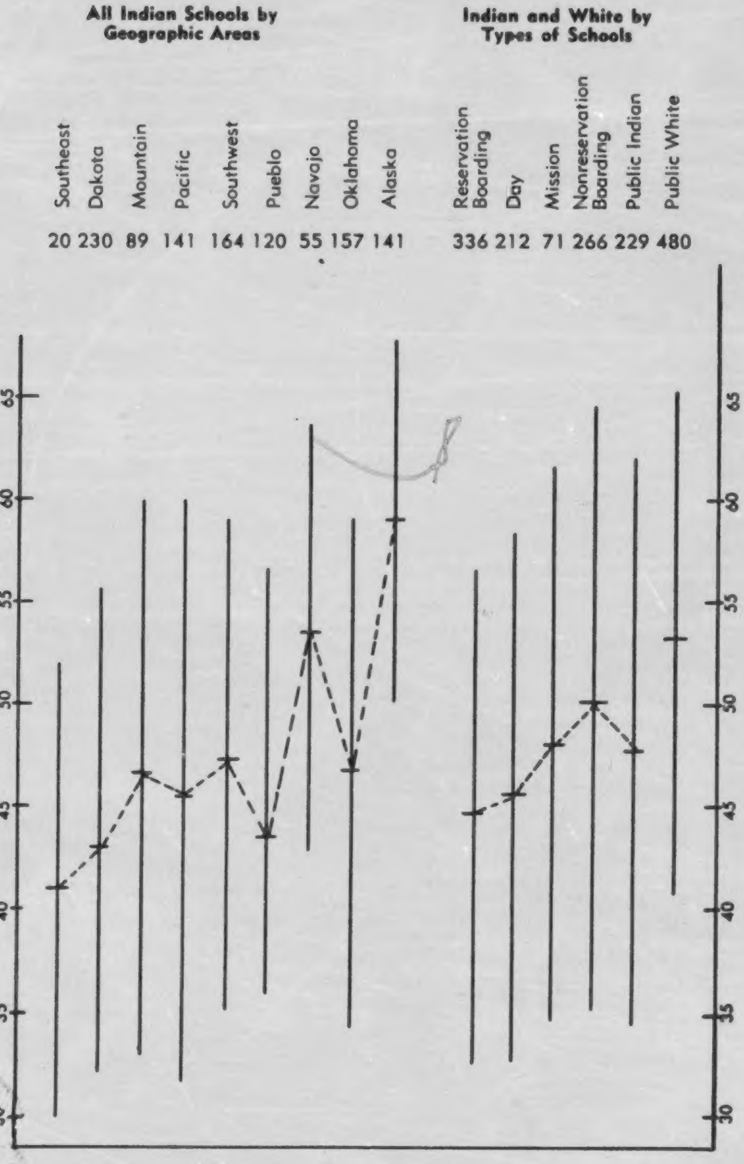


FIGURE 10

UNITED STATES INDIAN BUREAU FREE WRITING TEST—LENGTH

MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 8, 1950

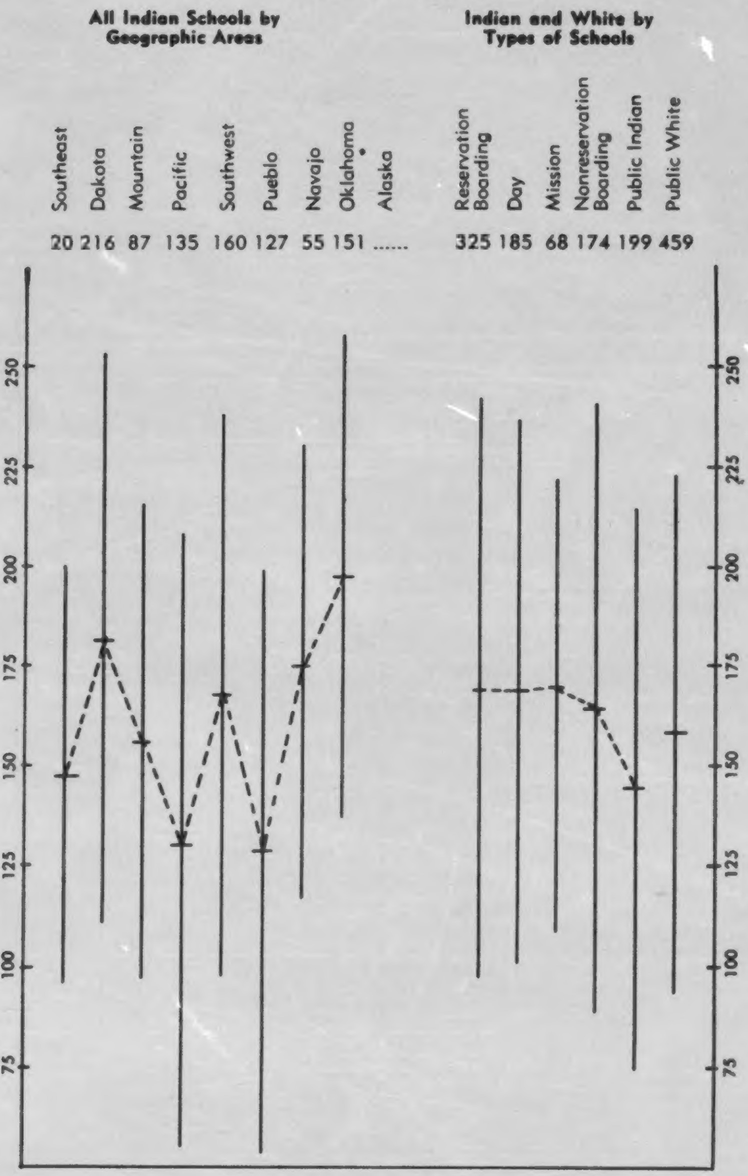


FIGURE 11

UNITED STATES INDIAN BUREAU FREE WRITING TEST—ERRORS (PER 60 WORDS)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950

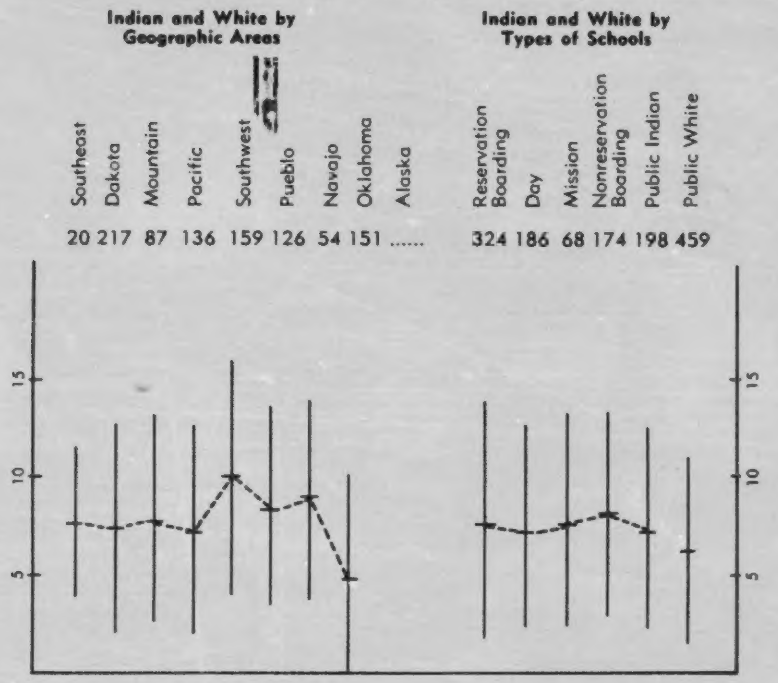
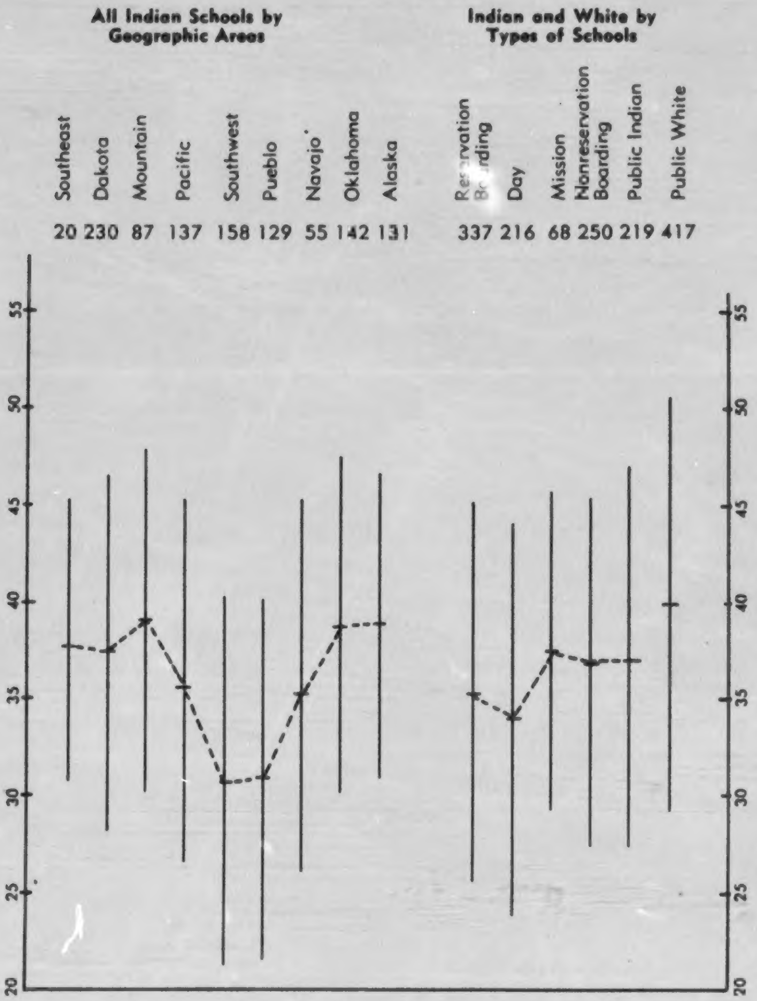


FIGURE 12

UNITED STATES INDIAN BUREAU USE OF RESOURCES TEST
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 8, 1950



In order to establish ranks based upon the twelve tests as a whole, each of the areas was given a rank on each test. The area with the highest mean was given a rank of 1 on a particular test. The area with the next highest mean was given a rank of 2 on the same test. The other areas were ranked accordingly. Each area was given a rank based on the mean rank for all twelve tests. This system produced the following rank order from best performance on all twelve tests to the poorest performance on all twelve tests: (1) Alaska, (2) Oklahoma, (3) Mountain, (4) Navajo, (5) Dakota, (6) Pacific, (7) Southeast, (8) Pueblo, and (9) Southwest. However, on all the tests, there was considerable overlapping, some children in all areas exceeding the mean of the best group.

The differences in achievement noted in this discussion were no doubt influenced by differences in cultural and educational backgrounds of the children in the various areas. These differences in background were discussed in Chapter II.

Although the data were sketchy, rank order correlations* were run between the ranks on the tests as a whole and the ranks of the areas according to the: (1) percentages of children usually speaking **English** as a pre-school language, (2) percentages of children usually speaking an **Indian dialect** as a pre-school language, (3) educational level reached by the mother, (4) percentages of children having **all Indian** friends, (5) percentages of children having **mostly white but some Indian** friends, (6) percentages of **fullblood** Indians, and (7) percentages of **halfblood** Indians. The correlations were respectively: .42, —.42, .29, —.03, —.03, —.43, and .67. In other words, the greater the degree of contact of the Indian child with the white man's culture, the higher he scores on educational tests. The readers should be reminded that, for the most part, the tests used in the 1950 testing program were originally constructed for use with the American public school population. One must caution the reader that the rank order correlations were based on an N of nine and on very flimsy data. A better designed study with regard to these factors might definitely establish the relationships suggested here.

●Achievement of Indian Children in the Twelfth Grade

Figures 13-24 portray graphically the achievement of Indian children in the twelfth grade in the nine geographic areas. The same explanation with regard to the line graphs as described for grade eight holds for the twelfth grade.

---

*The significance of a rank correlation coefficient may be tested by means of Olds's Tables.** When N is 9 as in the case of the correlations computed for the nine areas, correlations of .60 and —.60 would have sums of squares of rank differences of 48 and 192 respectively. The probability of not exceeding 48 by chance alone or of getting less than 192 by chance alone, is .0470. It may be concluded at this level, that a correlation exists between the two rankings.

In light of the above discussion, the probability that the sum of squares of rank differences, when N is 9, will not be exceeded by chance alone (in the case of a positive correlation) is: (1) about .05 when r is .60, (2) about .10 when r is .48, and (3) about .20 when r is .33. The same probabilities hold for negative correlations of the same size.

The probability that the sum of squares of rank differences, when N is 5, will not be exceeded by chance alone (in the case of a positive correlation) is: (1) about .05 when r is .85, (2) about .10 when r is .70, and (3) about .20 when r is .55. The same probabilities hold for negative correlations of the same size.

E. G. Olds. "Distributions of Sums of Squares of Rank Differences for Small Numbers of Individuals." **Annals of Mathematical Statistics, 9 (March 1938) 133-149.

FIGURE 13

PRESSEY VOCABULARY TEST

MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950

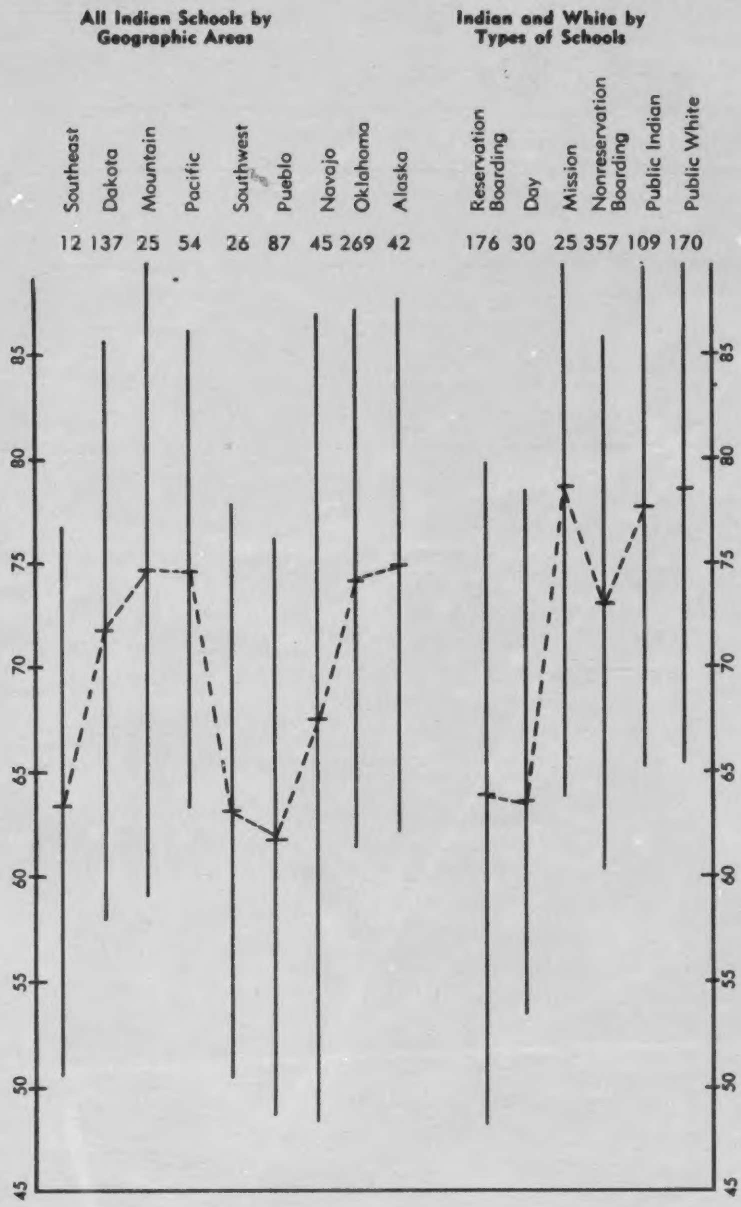


FIGURE 14

GATES BASIC READING TEST—TYPE B
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950

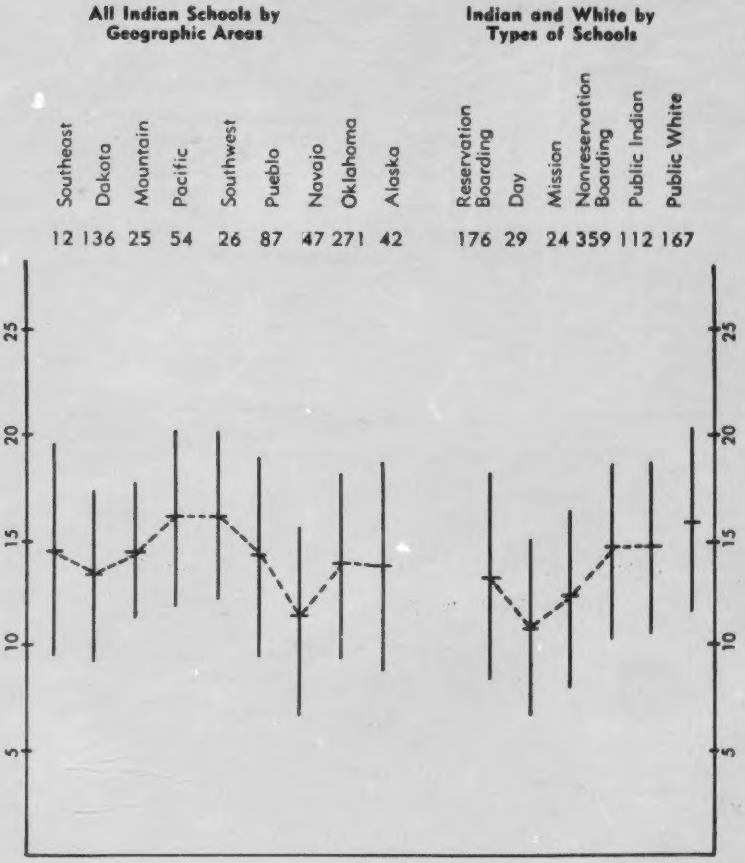


FIGURE 15

GATES BASIC READING TEST—TYPE D
MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950

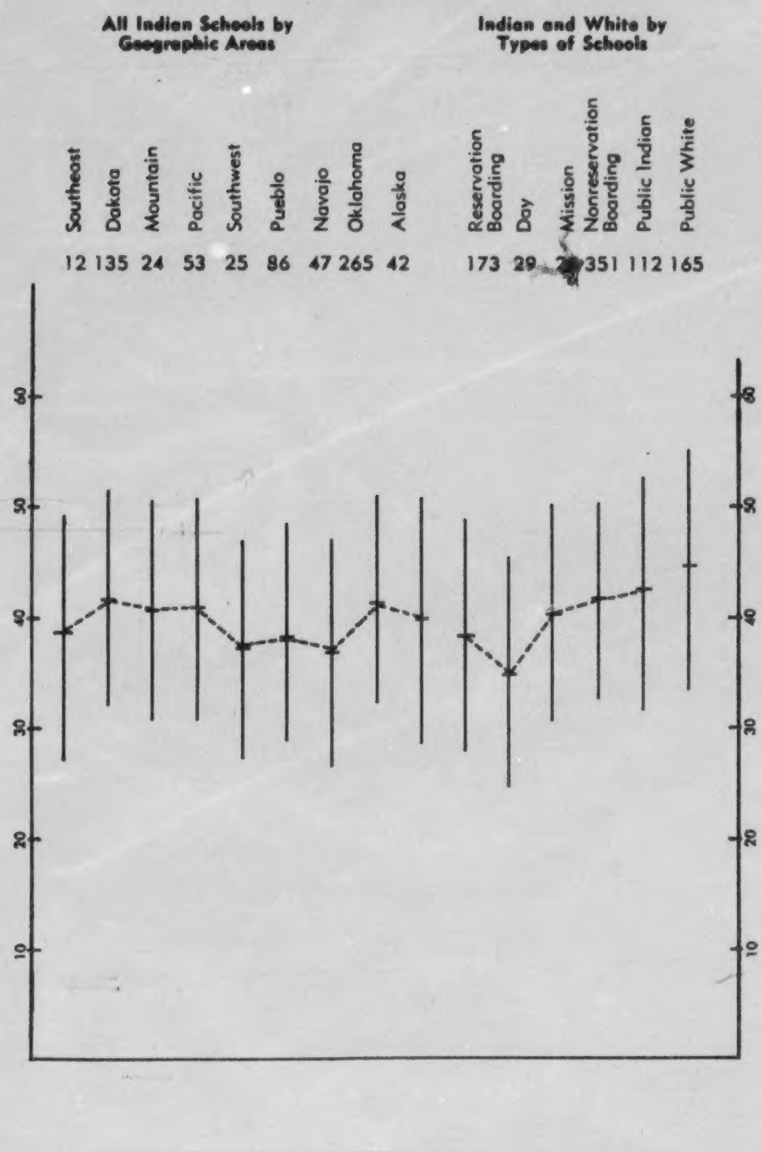


FIGURE 16

PRESSEY ENGLISH TEST—SECTION A
(CAPITALIZATION)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950

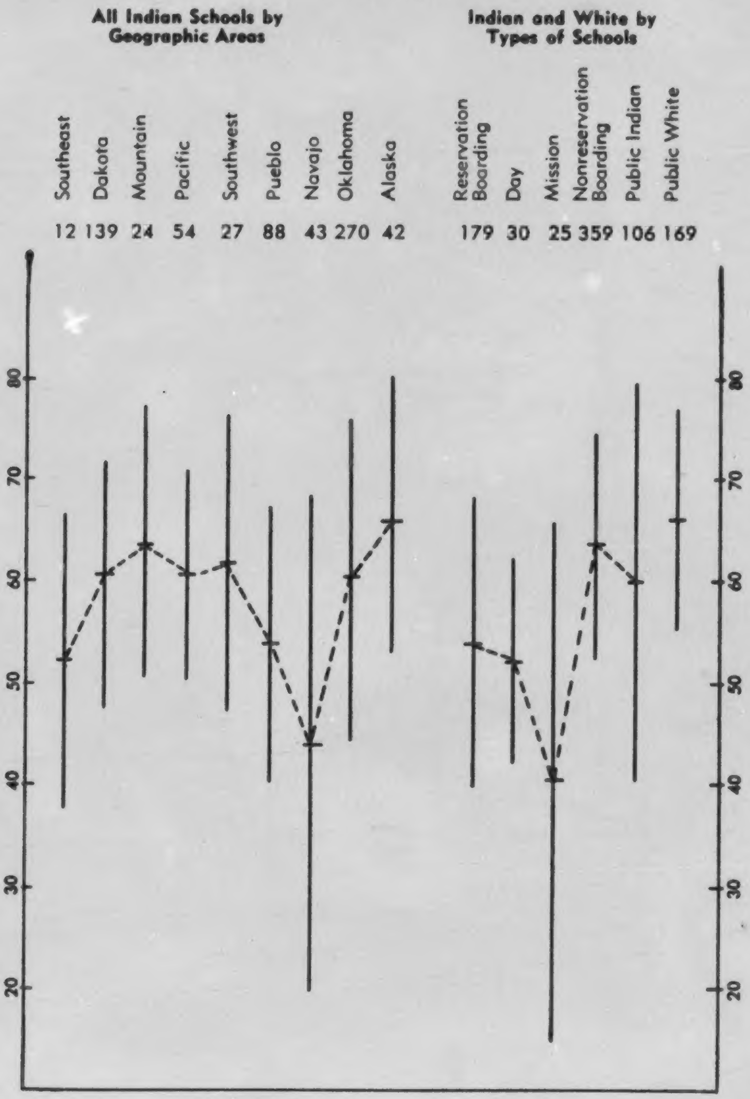


FIGURE 17

PRESSEY ENGLISH TEST—SECTION B (USAGE)
MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950

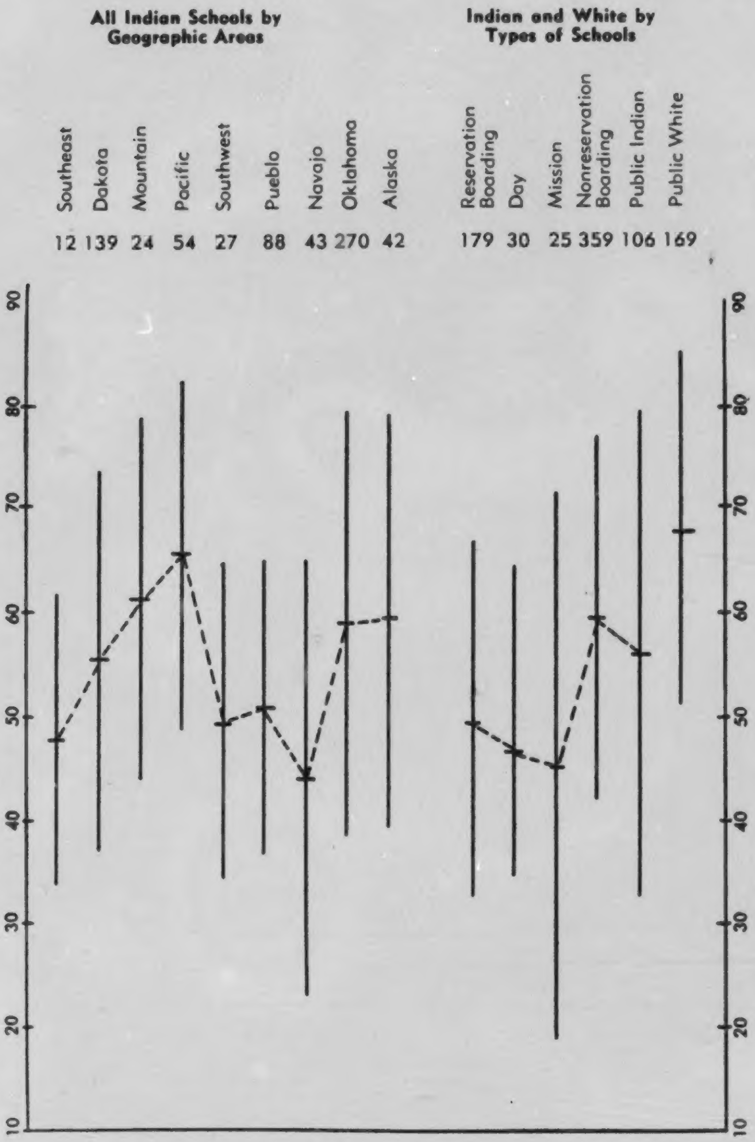
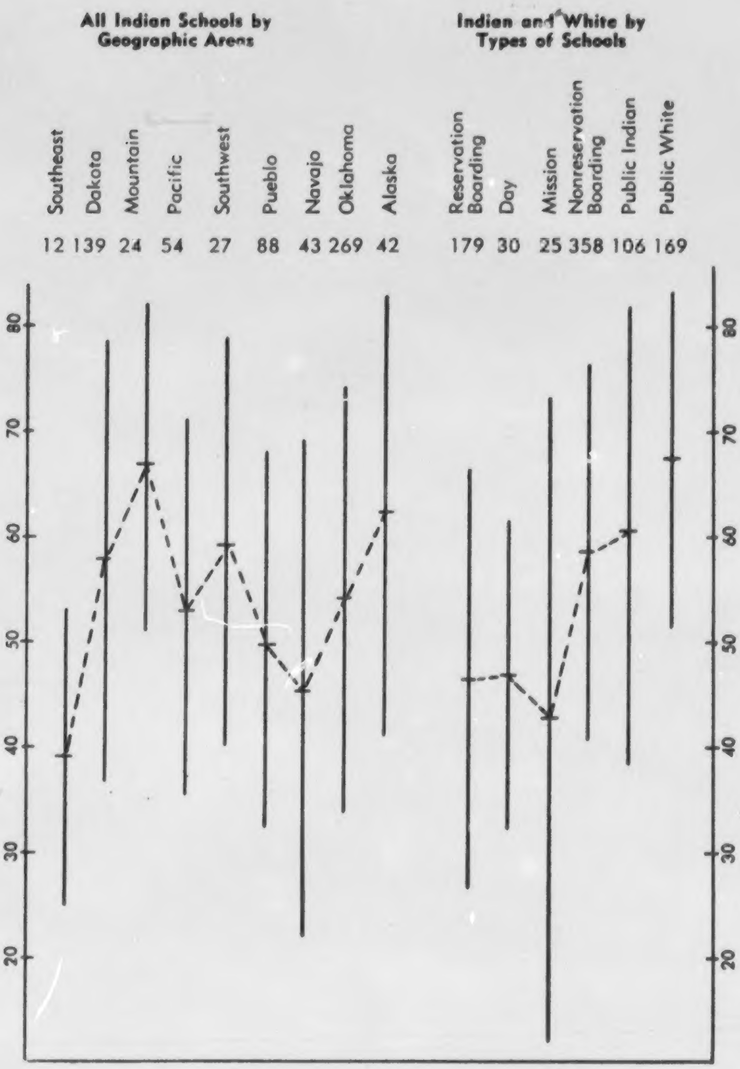


FIGURE 18

PRESSEY ENGLISH TEST--SECTION C (PUNCTUATION)
MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950



All Indian Schools by Geographic Areas

Indian and White by Types of Schools

FIGURE 19

PRESSEY ENGLISH TEST—SECTION D
(SENTENCE STRUCTURE)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950

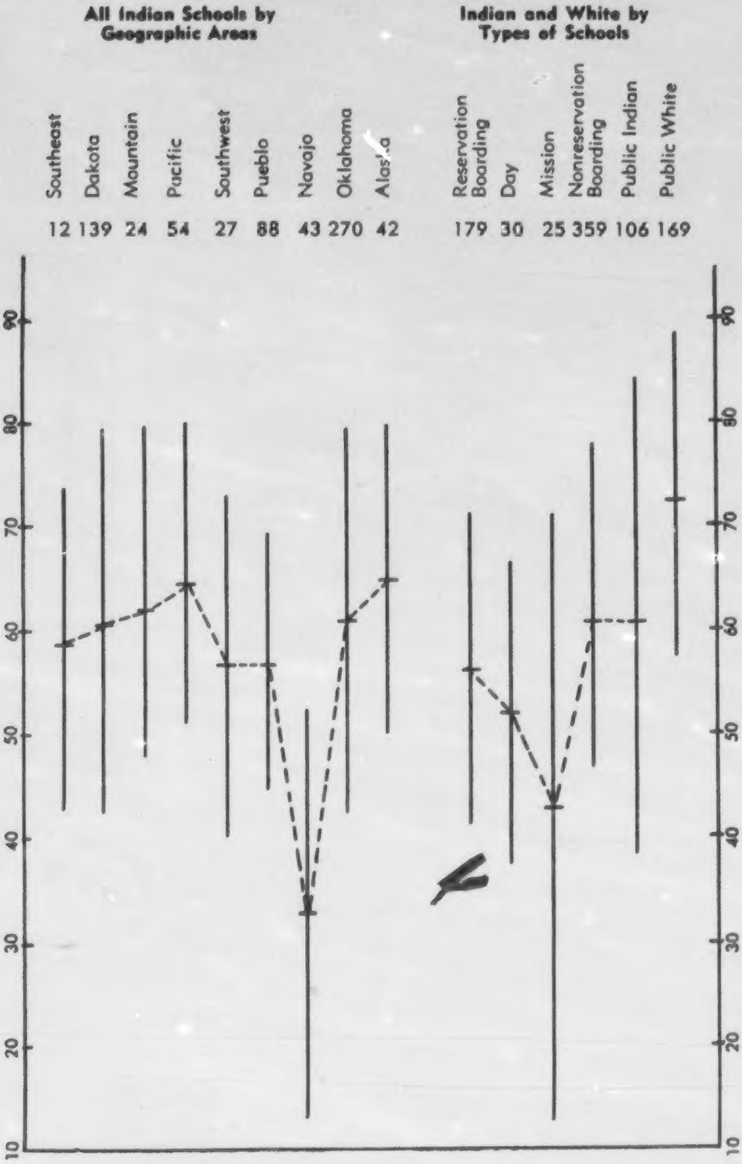


FIGURE 20

UNITED STATES INDIAN BUREAU ARITHMETIC TEST
FACTOR ABILITIES
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950

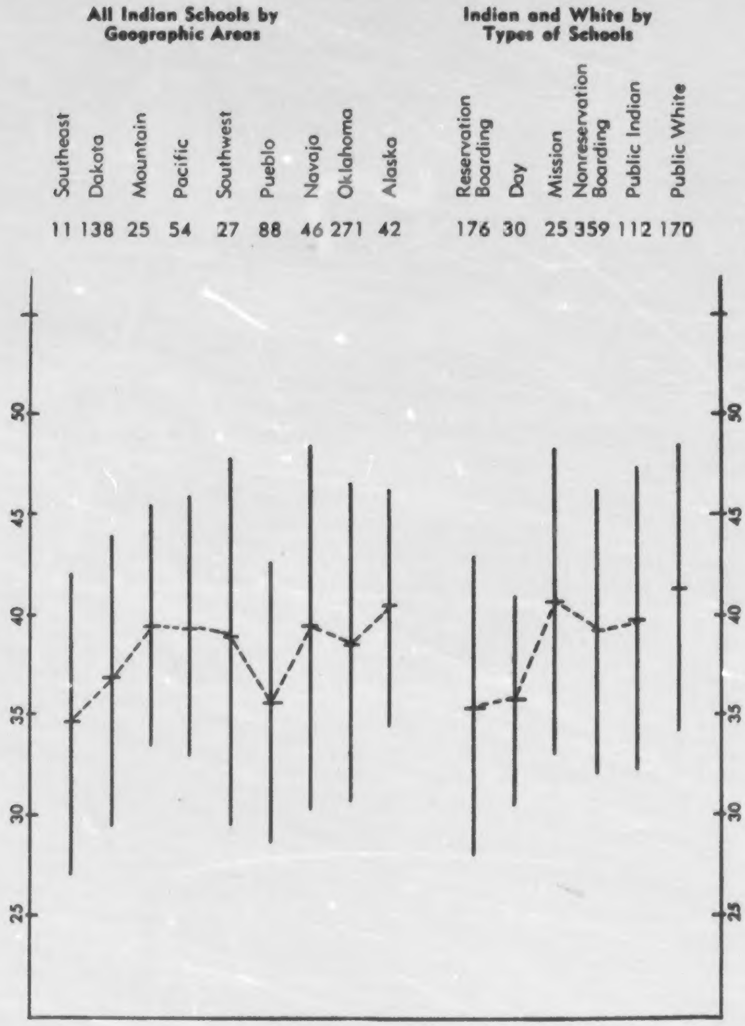


FIGURE 21

UNITED STATES INDIAN BUREAU FREE WRITING TEST—LENGTH

MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950

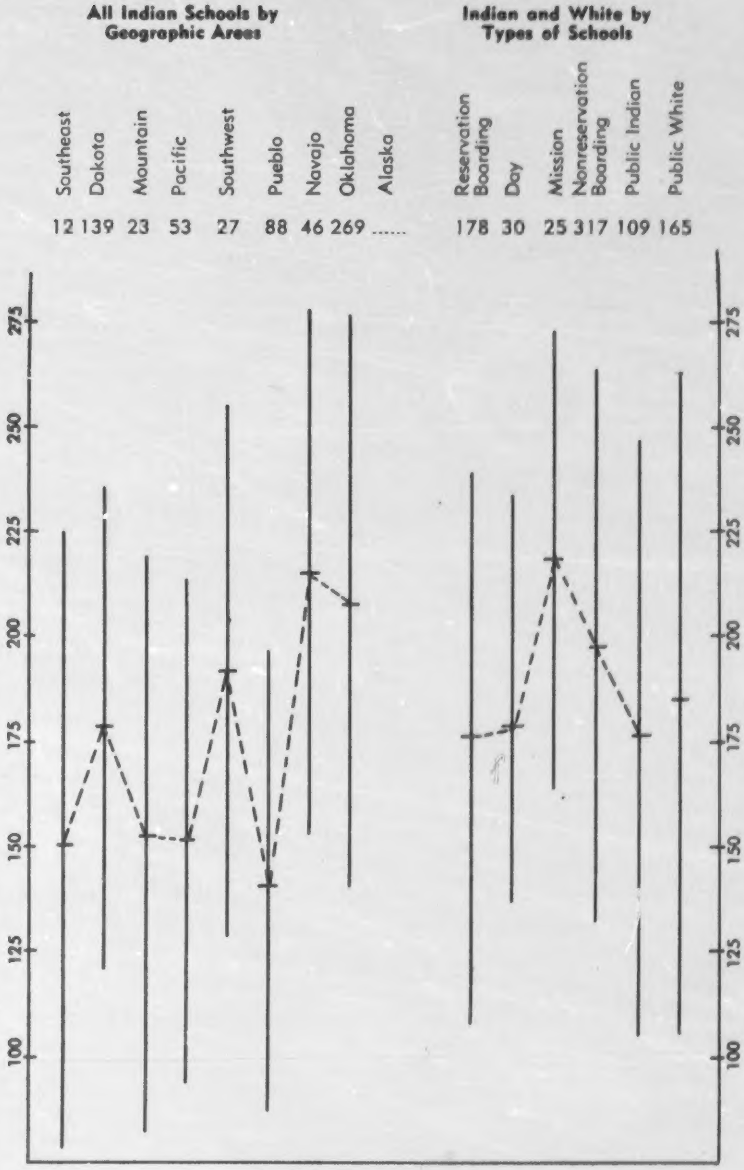


FIGURE 22

UNITED STATES INDIAN BUREAU FREE WRITING TEST—ERRORS (PER 60 WORDS)
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950

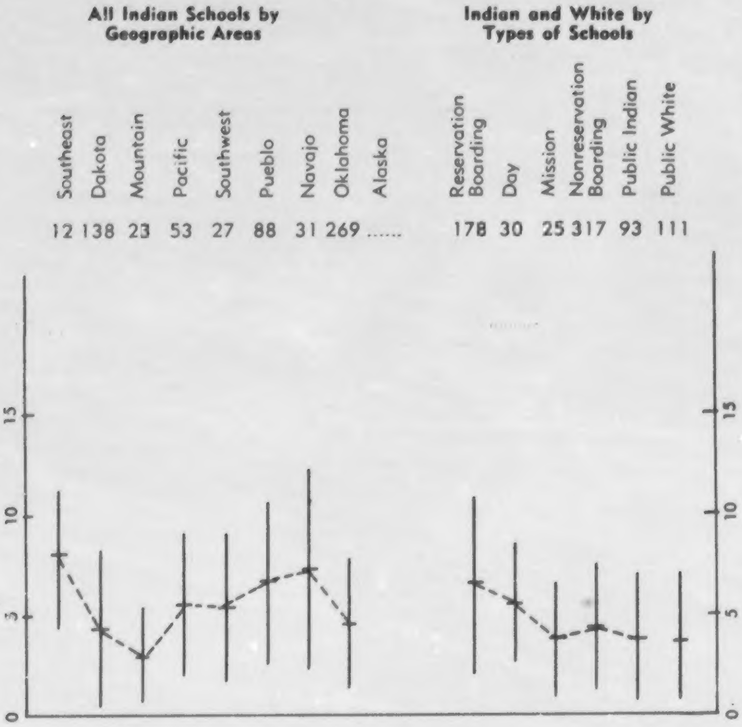


FIGURE 23

UNITED STATES INDIAN BUREAU USE OF RESOURCES TEST

MEAN SCORE + AND — ONE STANDARD DEVIATION

GRADE 12, 1950

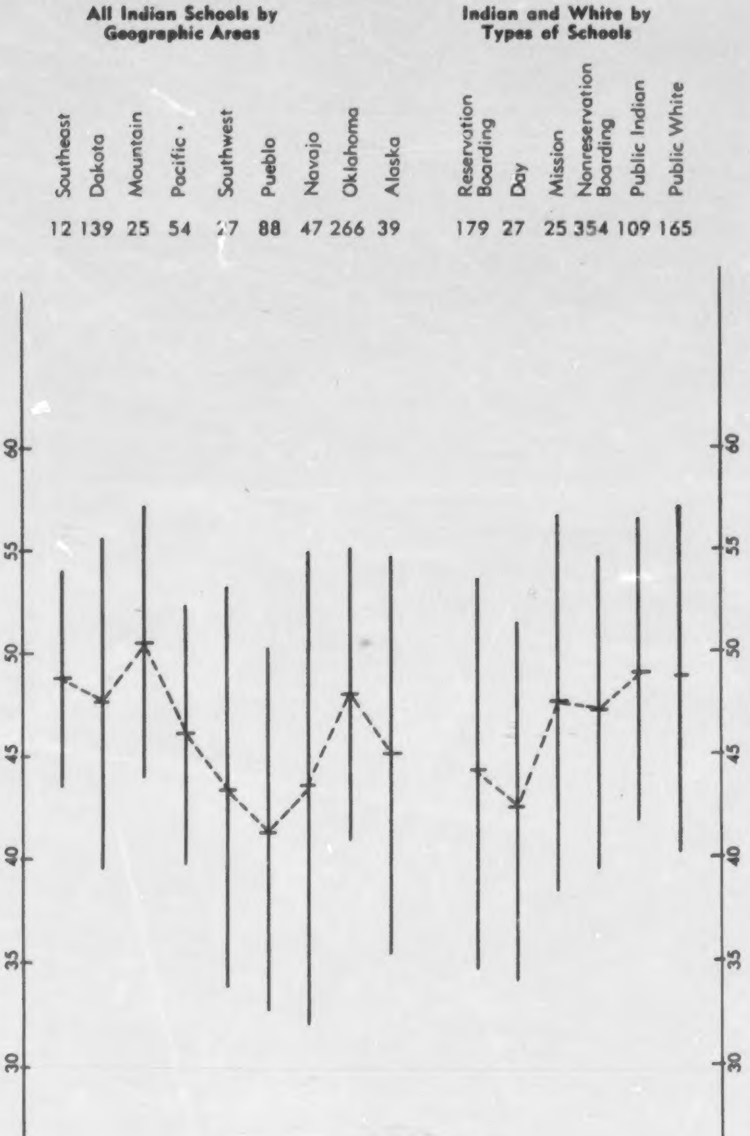
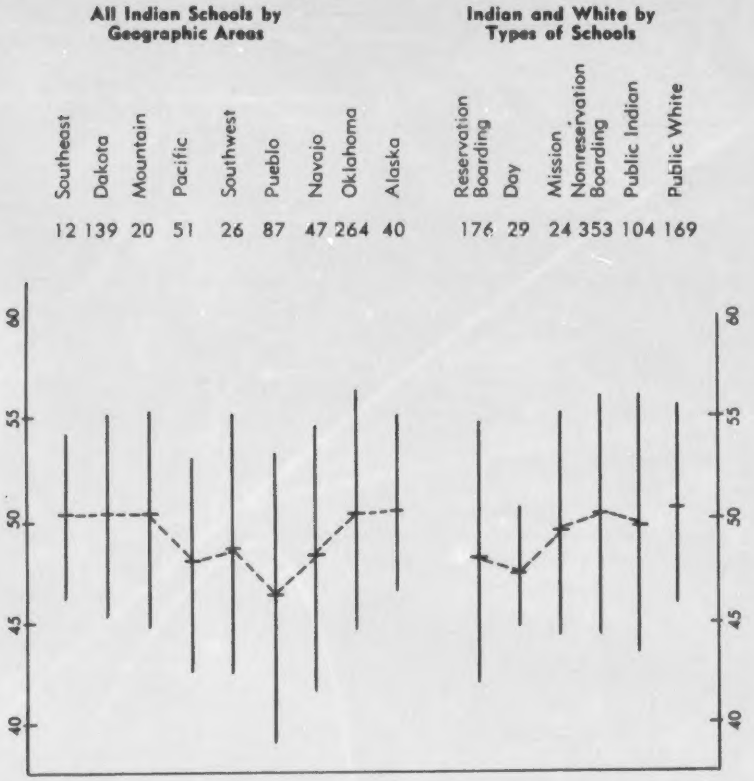


FIGURE 24

UNITED STATES INDIAN BUREAU HEALTH AND SAFETY TEST
MEAN SCORE + AND — ONE STANDARD DEVIATION
GRADE 12, 1950



Using the same ranking system as with grade eight, the rank order of the areas from best performance on all twelve tests to poorest performance on all twelve tests was as follows: (1) Alaska, (2) Mountain, (3) Oklahoma, (4) Pacific, (5) Dakota, (6) Southwest, (7) Southeast, (8) Navajo, and (9) Pueblo.

The differences in achievement noted were no doubt influenced by differences in cultural and educational backgrounds of the children. These differences were discussed in Chapter II.

Although the data were sketchy, rank order correlations were computed between the ranks on the tests as a whole and the ranks of the areas according to the: (1) percentages of children usually speaking **English** as a pre-school language, (2) percentages of children usually speaking an **Indian dialect** as a pre-school language, (3) percentages of children having **all Indian** friends, (4) percentages of children having **mostly white but some Indian** friends, (5) percentages of **fullblood** Indians, and (6) percentages of **halfblood** Indians. These correlations were respectively: .55, —.37, —.37, .40, —.38, and .78.

●Comparison of Areas by Grade Levels

The rank order correlation between the ranks of the areas on the eighth grade level on the tests as a whole and the ranks of the areas on the twelfth grade level on the tests as a whole was .73. This indicates that the areas were quite consistent in performance on the tests as a whole on the eighth and twelfth grade levels. This tentatively establishes a hierarchy of areas with regard to educational achievement.

THE ACHIEVEMENT OF THE EIGHTH AND TWELFTH GRADES ON THE SAME TESTS

The children in the eighth and twelfth grades took these same tests: **Pressey Vocabulary, USIST Arithmetic-Factor Abilities, USIST Free Writing-Length and Errors, USIST Use of Resources, Pressey Capitalization, Pressey Good Usage, Pressey Punctuation,** and **Pressey Sentence Structure.**

Table 16 shows the percentage of students in the various types of schools in the eighth grade who exceeded the mean of the twelfth grade. An important consideration in a comparison involving two grade levels, is whether or not the tests had a ceiling for the upper grade level. An examination of the distributions for these nine tests showed that only one of the tests had a ceiling for the twelfth grade. This test was the **Pressey Vocabulary.** About 20 per cent of the twelfth graders fell in the top class interval, which is an indication that the same students might have scored higher had the test been longer.

In a sense, the less the percentage of overlap between the two grades, the greater the development from grade eight to twelve. This would be especially true if the scores represented the achievement of the same pupils on the same tests when in grade eight and when in grade twelve. However, the students represented here were eighth graders in 1950 and twelfth graders in 1950. The percentages of overlap as shown in Table 16 are quite considerable indicating that the students in the eighth grade had achieved higher standards than their counterparts in the twelfth grade. This seems to indicate that an upsurge is taking place in Indian education.

An examination of Table 16 indicates that the percentages of overlap were lowest for the nonreservation boarding and Indians in public schools. This would point to the conclusion that more educational growth had taken place in four years on the part of the twelfth graders in these types of schools than in the reservation boarding, day, and mission schools.

TABLE 16

PERCENTAGE OF STUDENTS IN THE EIGHTH GRADE EXCEEDING THE MEAN OF THE TWELFTH GRADE

TEST:	Pressey Vocabulary	USIST Arithmetic—Factor Abilities	USIST Free Writing—Length	USIST Free Writing—Errors	USIST Use of Resources	Pressey Capitalization	Pressey Good Usage	Pressey Punctuation	Pressey Sentence Structure
TYPE OF SCHOOL:									
Reservation Boarding	21.2	46.8	47.2	40.9*	20.1	39.0	35.9	27.8	29.8
Day	17.9	47.2	43.6	34.8	22.7	43.3	32.6	33.4	43.6
Mission	12.7	28.4	21.5	23.6	12.7	74.5	44.4	49.6	56.8
Nonreservation Boarding	9.3	44.8	33.7	23.9	13.4	30.5	14.5	17.9	28.8
Public Indian	3.1	34.8	33.4	25.8	13.1	39.0	21.5	21.2	32.3

*About 40.9 per cent of the eighth grade had less errors per 60 words than the mean of the twelfth grade.

ACHIEVEMENT OF THE EIGHTH AND TWELFTH GRADE STUDENTS BY TYPES OF SCHOOLS

Tables 17-40 indicate the differences in means, the standard error of the differences, and the critical ratios between the six types of schools. Fifteen critical ratios are presented for each test. The symbols on the left hand side of each table refer to the following types of schools:

RB —Reservation Boarding
D —Day
M —Mission
NRB —Nonreservation Boarding
PI —Indian children in public schools
PW —White children in public schools

●Achievement of the Eighth Grade Students by Types of Schools

An examination of Tables 17-28 revealed that Indian students in the:

1. Reservation boarding schools achieved no more on the twelve tests than did the children in the day and mission schools.

2. Nonreservation boarding schools achieved significantly more than the children in the reservation boarding schools on five tests: **Pressey Punctuation, Reading to Appreciate General Significance, Reading to Understand Precise Directions, Orleans Arithmetic Computation,** and **Arithmetic-Factor Abilities.**

3. Public schools achieved significantly more than the children in the reservation boarding schools on five tests: **Pressey Vocabulary, Pressey Punctuation, Reading to Appreciate General Significance, Reading to Understand Precise Directions,** and **Arithmetic-Factor Abilities.** The reverse was true in the case of the **Free Writing Test-Length.**

4. Mission schools achieved significantly more than the children in the day schools on only one test, namely, **Pressey Vocabulary.**

5. Nonreservation boarding schools achieved significantly more than the children in the day schools on six tests: **Pressey Vocabulary, Pressey Capitalization, Pressey Punctuation, Reading to Appreciate General Significance, Reading to Understand Precise Directions, Arithmetic-Factor Abilities,** and **Use of Resources.**

6 Public schools achieved significantly more than the children in the day schools on four tests: **Pressey Vocabulary, Pressey Capitalization, Pressey Punctuation,** and **Use of Resources.**

7. Nonreservation boarding schools achieved significantly more than the children in the mission schools on two tests: **Pressey Capitalization** and **Reading to Understand Precise Directions.**

8. Public schools achieved no more on the twelve tests than did the children in the mission and nonreservation boarding schools.

TABLE 17
CRITICAL RATIOS FOR GRADE 8 ON PRESSEY VOCABULARY TEST

Comparison Between		Difference in Means	S. E. of Difference	Critical Ratio
RB*	vs D	2.61	1.20	2.18
RB	vs M*	4.64	2.28	2.04
RB	vs NRB*	1.38	1.11	1.24
RB	vs PI*	4.36	1.02	4.27**
RB	vs PW*	5.02	1.08	4.65**
D	vs M*	7.25	2.37	3.06*
D	vs NRB*	3.99	1.28	3.12*
D	vs PI*	6.97	1.20	5.81**
D	vs PW*	7.63	1.25	6.10**
M*	vs NRB	3.26	2.32	1.41
M*	vs PI	.28	2.28	0.12
M	vs PW*	.38	2.31	0.17
NRB	vs PI*	2.98	1.11	2.68
NRB	vs PW*	.66	1.17	0.56
PI	vs PW*	.66	1.08	0.61

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 18
CRITICAL RATIOS FOR GRADE 8 ON GATES BASIC READING—TYPE A

Comparison Between		Difference in Means	S. E. of Difference	Critical Ratio
RB*	vs D	1.20	.46	2.61
RB*	vs M	1.40	.75	1.87
RB	vs NRB*	.98	1.46	.67
RB	vs PI*	.61	.45	1.36
RB	vs PW*	2.29	.39	5.87**
D*	vs M	.20	.77	.26
D	vs NRB*	2.18	.50	4.36**
D	vs PI*	1.81	.49	3.69**
D	vs PW*	3.49	.44	7.93**
M	vs NRB*	2.38	.77	3.09*
M	vs PI*	2.01	.77	2.61
M	vs PW*	3.69	.73	5.05**
NRB*	vs PI	.37	.49	.76
NRB	vs PW*	1.31	.44	2.98*
PI	vs PW*	1.68	.43	3.91**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 19

CRITICAL RATIOS FOR GRADE 8 ON GATES BASIC READING—TYPE C

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	1.20	.41	2.93
RB* vs M	.89	.58	1.53
RB* vs NRB	.56	.38	1.47
RB* vs PI	.89	.42	2.12
RB vs PW*	1.36	.32	4.25**
D vs M*	.31	.61	.51
D vs NRB*	.64	.43	.49
D vs PI*	.31	.46	.67
D vs PW*	2.56	.38	6.74**
M vs NRB*	.33	.60	.55
M vs PI	.00	.62	.00
M vs PW*	2.25	.56	4.02**
NRB* vs PI	.33	.44	.75
NRB vs PW*	1.92	.35	5.49**
PI vs PW*	2.25	.39	5.77**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 20

CRITICAL RATIOS FOR GRADE 8 ON PRESSEY ENGLISH—SECTION A

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	.67	1.47	.46
RB vs M*	3.43	2.37	1.45
RB vs NRB*	6.70	1.40	4.85**
RB vs PI*	6.38	1.44	4.43**
RB vs PW*	10.38	1.22	8.51**
D vs M*	2.76	2.42	1.14
D vs NRB*	6.12	1.49	4.11**
D vs PI*	5.71	1.53	3.73**
D vs PW*	9.71	1.32	7.36**
M vs NRB*	3.36	2.38	1.41
M vs PI*	2.93	2.41	1.22
M vs PW*	6.95	2.28	3.05*
NRB* vs PI	.41	1.46	.28
NRB vs PW*	3.59	1.24	2.90
PI vs PW*	4.00	1.30	3.08*

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 21
CRITICAL RATIOS FOR GRADE 8 ON PRESSEY ENGLISH—SECTION B

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	2.50	1.21	2.07
RB* vs M	.83	2.28	.36
RB* vs NRB	.34	1.28	2.66
RB vs PI*	.01	1.36	.01
RB vs PW*	7.14	1.17	6.10**
D vs M*	1.67	2.27	.74
D vs NRB*	2.16	1.26	1.71
D vs PI*	2.51	1.34	1.87
D vs PW*	9.64	1.15	8.38**
M vs NRB*	.49	2.30	.21
M vs PI*	.84	2.35	.36
M vs PW*	7.97	2.25	3.54**
NRB vs PI*	.35	1.39	.25
NRB vs PW*	7.48	1.22	6.13**
PI vs PW*	7.13	1.30	5.48**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 22
CRITICAL RATIOS FOR GRADE 8 ON PRESSEY ENGLISH—SECTION C

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	3.40	1.70	2.00
RB vs M*	7.35	2.61	2.82
RB vs NRB*	6.95	1.52	4.57**
RB vs PI*	7.57	1.81	4.18**
RB vs PW*	15.23	1.43	10.65**
D vs M*	3.95	2.75	1.44
D vs NRB*	3.55	1.74	2.04
D vs PI*	4.15	2.00	2.07
D vs PW*	11.83	1.66	7.13**
M* vs NRB	.40	2.64	.15
M vs PI*	.22	2.78	.08
M vs PW*	7.88	2.59	3.04*
NRB vs PI*	.62	1.85	.34
NRB vs PW*	8.26	1.48	5.58**
PI vs PW*	7.66	1.78	4.30**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 23
CRITICAL RATIOS FOR GRADE 8 ON PRESSEY ENGLISH—SECTION D

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	1.66	1.44	1.15
RB* vs M	1.21	2.56	.47
RB vs NRB*	6.88	1.31	5.25**
RB vs PI*	5.59	1.42	3.94**
RB vs PW*	13.17	1.18	11.16**
D* vs M	2.88	2.63	1.10
D vs NRB*	5.22	1.44	3.63**
D vs PI*	3.93	1.54	2.55
D vs PW*	11.51	1.32	8.71**
M vs NRB*	8.10	2.56	3.18*
M vs PI*	6.81	2.62	2.60
M vs PW*	14.39	2.50	5.76**
NRB* vs PI	1.29	1.42	.91
NRB vs PW*	6.29	1.19	5.29**
PI vs PW*	7.58	1.30	5.83**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 24
CRITICAL RATIOS FOR GRADE 8 ON ARITHMETIC-FACTOR ABILITIES

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	.08	.80	.10
RB vs M*	.44	1.19	.37
RB vs NRB*	3.07	.70	4.38**
RB vs PI*	.77	.77	1.00
RB vs PW*	3.44	.58	5.93**
D vs M*	.36	1.24	.29
D vs NRB*	.01	.80	.01
D vs PI*	.69	.86	.80
D vs PW*	3.36	.69	4.86**
M vs NRB*	2.63	1.23	2.14
M vs PI*	.33	1.27	.26
M vs PW*	3.00	1.16	2.59
NRB* vs PI	2.30	.84	2.73
NRB vs PW*	.37	.66	.56
PI vs PW*	2.67	.74	3.60**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 25
CRITICAL RATIOS FOR GRADE 8 ON ORLEANS ARITHMETIC COMPUTATION

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	.76	1.11	.68
RB vs M*	3.80	1.76	2.16
RB vs NRB*	5.56	1.13	4.92**
RB vs PI*	3.38	1.10	3.07*
RB vs PW*	8.57	.87	9.85**
D vs M*	3.04	1.76	1.73
D vs NRB*	4.80	1.13	4.25**
D vs PI*	2.62	1.10	2.38
D vs PW*	7.81	.87	9.05**
M vs NRB*	1.76	1.86	.95
M* vs PI	.42	1.85	.23
M vs PW*	4.77	1.72	2.77
NRB* vs PI	2.18	1.26	1.73
NRB vs PW*	3.01	1.07	2.81
PI vs PW*	5.19	1.04	4.99**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 26
CRITICAL RATIOS FOR GRADE 8 ON FREE WRITING-LENGTH

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	1.05	6.41	.16
RB vs M*	.30	8.59	.03
RB* vs NRB	7.39	7.10	1.04
RB* vs PI	25.14	6.43	3.91**
RB* vs PW	11.84	5.06	2.34
D vs M*	1.35	9.08	.15
D* vs NRB	2.34	7.68	.30
D* vs PI	24.19	7.06	3.43**
D* vs PW	10.79	5.84	1.85
M* vs NRB	3.69	9.57	.39
M* vs PI	25.54	9.09	2.81
M* vs PW	12.14	8.18	1.48
NRB* vs PI	21.85	7.69	2.84
NRB* vs PW	8.45	6.59	1.28
PI vs PW*	8.45	5.86	1.44

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 27
CRITICAL RATIOS FOR GRADE 8 ON FREE WRITING-ERRORS

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	.19	.50	.38
RB* vs M	.16	.74	.22
RB vs NRB*	.41	.52	.79
RB* vs PI	.66	.49	1.35
RB* vs PW	1.57	.40	3.93**
D vs M*	.13	.76	.17
D vs NRB*	.70	.55	1.27
D* vs PI	.37	.52	.71
D* vs PW	1.28	.44	2.91
M vs NRB*	.57	.77	.74
M* vs PI	.50	.75	.67
M* vs PW	1.41	.70	2.01
NRB* vs PI	1.07	.53	2.02
NRB* vs PW	1.98	.45	4.40**
PI* vs PW	.91	.42	2.17

*Higher Mean. (More errors).

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 28
CRITICAL RATIOS FOR GRADE 8 ON USE OF RESOURCES

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	1.42	.89	1.60
RB vs M*	2.21	1.15	1.92
RB vs NRB*	1.48	.77	1.92
RB vs PI*	.15	.81	.17
RB vs PW*	4.69	.76	6.17**
D vs M*	2.63	1.24	2.12
D vs NRB*	2.90	.90	3.22*
D vs PI*	3.27	.98	3.34*
D vs PW*	6.11	.89	6.87**
M* vs NRB	.73	1.16	.63
M* vs PI	.36	1.23	.29
M vs PW*	2.48	1.15	2.16
NRB vs PI*	.37	.88	.42
NRB vs PW*	3.21	.76	4.22**
PI vs PW*	2.84	.87	3.26*

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

An examination of Tables 17-28 revealed that the white children in the public schools achieved significantly more than the Indian children in the:

1. Reservation boarding schools on eleven tests.
2. Day schools on ten tests.
3. Mission schools on six tests.
4. Nonreservation boarding schools on seven tests.
5. Public schools on nine tests.

Thus, in competition with the white schools, the rankings of the Indian schools in terms of significant critical ratios in order from best to poorest were: Nonreservation boarding, mission, reservation boarding, public Indian, and day.

Using the same ranking system as described for grade eight with geographic areas, the rank order of the types of schools from the best performance on all twelve tests to poorest performance on all twelve tests was as follows: (1) Public Indian, (2) nonreservation boarding, (3) mission, (4) reservation boarding, and (5) day. Although the N was only five, rank order correlations were run between the ranks given above and the ranks according to: (1) percentages of children usually speaking **English** as a pre-school language, (2) percentages of children usually speaking an **Indian dialect** as a pre-school language, (3) educational level reached by the mother, (4) percentages of children having **all Indian** friends, (5) percentages of children having **mostly white but some Indian** friends, (6) percentages of **fullblood** Indians, and (7) percentages of **halfblood** Indians. The correlations were respectively: .60, —.70, .67, —.53, .60, —.90, and —.10.

● Achievement of the Twelfth Grade Students by Types of Schools

An examination of Tables 29-40 revealed that Indian children in the:

1. Reservation boarding schools achieved no more on the twelve tests than did the children in the day schools.

2. Mission schools achieved significantly more than the children in the reservation boarding schools on three tests: **Arithmetic-Factor Abilities, Free Writing-Length,** and **Free Writing-Errors.**

3. Nonreservation boarding schools achieved significantly more than the children in the reservation boarding schools on all twelve tests.

4. Public schools achieved significantly more than the children in the reservation boarding schools on six tests: **Pressey Vocabulary, Pressey Good Usage, Reading to Predict Outcomes of Given Events, Arithmetic-Factor Abilities, Use of Resources,** and **Free Writing-Errors.**

5. Mission schools achieved significantly more than the children in the day schools on only one test: **Pressey Vocabulary.**

6. Nonreservation boarding schools achieved significantly more than the children in the day schools on nine tests: **Pressey Vocabulary, Pressey Capitalization, Pressey Good Usage, Pressey Punctuation, Pressey Sentence Structure, Reading to Predict the Outcomes of Given Events, Reading to Note Details, Arithmetic-Factor Abilities,** and **Health and Safety.**

7. Public schools achieved significantly more than the children in the day schools on seven tests: **Pressey Vocabulary, Pressey Capitalization, Pressey Good Usage, Pressey Sentence Structure, Reading to Predict the Outcomes of Given Events, Arithmetic-Factor Abilities,** and **Use of Resources.**

8. Nonreservation boarding schools achieved significantly more than the children in the mission schools on two tests: **Pressey Punctuation** and **Reading to Note Details.**

9. Public schools achieved significantly more than the children in the mission schools on two tests: **Pressey Punctuation** and **Free Writing-Length.**

10. Public schools achieved significantly more than the children in the nonreservation boarding schools on one test: **Pressey Vocabulary.** The reverse was true with **Free Writing-Length.**

TABLE 29

CRITICAL RATIOS FOR GRADE 12 ON PRESSEY VOCABULARY TEST

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	.20	2.26	.09
RB vs M*	8.90	3.29	2.71
RB vs NRB*	9.10	1.37	6.64**
RB vs PI*	13.80	1.69	8.17**
RB vs PW*	14.70	1.57	9.36**
D vs M*	15.10	3.61	4.18**
D vs NRB*	9.30	2.03	4.58**
D vs PI*	14.00	2.25	6.22**
D vs PW*	14.90	2.16	6.90**
M* vs NRB	5.80	3.13	1.85
M* vs PI	1.10	3.28	.34
M* vs PW	.20	3.22	.06
NRB vs PI*	4.70	1.36	3.46**
NRB vs PW*	5.60	1.22	4.59**
PI vs PW*	.90	1.56	.58

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 30
CRITICAL RATIOS FOR GRADE 12 ON GATES BASIC READING—TYPE B

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	2.34	.85	2.75
RB* vs M	1.02	.94	1.09
RB vs NRB*	1.32	.42	3.14*
RB vs PI*	1.37	.53	2.58
RB vs PW*	2.67	.49	5.45**
D vs M*	1.32	1.17	1.13
D vs NRB*	3.66	.81	4.52**
D vs PI*	3.71	.87	4.26**
D vs PW*	5.01	.81	6.19**
M vs NRB*	2.34	.90	2.60
M vs PI*	2.39	.96	2.49
M vs PW*	3.69	.94	3.93**
NRB vs PI*	.05	.45	.11
NRB vs PW*	1.35	.40	3.38*
PI vs PW*	1.30	.52	2.50

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 31
CRITICAL RATIOS FOR GRADE 12 ON GATES BASIC READING—TYPE D

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	3.95	2.02	1.96
RB vs M*	2.00	2.15	.93
RB vs NRB*	3.25	.93	3.49**
RB vs PI*	3.80	1.27	2.99*
RB vs PW*	6.00	1.17	5.13**
D vs M*	5.90	2.72	2.17
D vs NRB*	7.20	1.91	3.77**
D vs PI*	7.75	2.10	3.69**
D vs PW*	9.95	2.04	4.88**
M vs NRB*	1.25	2.05	.61
M vs PI*	1.80	2.22	.81
M vs PW*	4.00	2.16	1.85
NRB vs PI*	.55	1.09	.50
NRB vs PW*	2.75	.97	2.84
PI vs PW*	2.20	1.30	1.69

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 32
CRITICAL RATIOS FOR GRADE 12 ON PRESSEY ENGLISH—SECTION A

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	1.60	2.16	.74
RB* vs M	13.60	5.30	2.57
RB vs NRB*	10.10	1.22	8.28**
RB vs PI*	5.90	2.17	2.72
RB vs PW*	12.70	1.35	9.41**
D* vs M	12.00	5.61	2.14
D vs NRB*	11.70	1.97	5.94**
D vs PI*	7.50	2.67	2.81
D vs PW*	14.30	2.05	6.98**
M vs NRB*	23.70	5.32	4.45**
M vs PI*	19.50	5.62	3.47**
M vs PW*	26.30	5.30	4.96**
NRB* vs PI	4.20	1.97	2.11
NRB vs PW*	4.60	1.02	4.51**
PI vs PW*	6.80	2.07	3.29*

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 33
CRITICAL RATIOS FOR GRADE 12 ON PRESSEY ENGLISH—SECTION B

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	2.70	2.48	1.09
RB* vs M	4.20	5.42	.77
RB vs NRB*	9.90	1.55	6.39**
RB vs PI*	6.50	2.56	2.54
RB vs PW*	18.30	1.80	10.16**
D* vs M	1.50	5.69	.26
D vs NRB*	12.60	2.32	5.43**
D vs PI*	9.20	3.09	2.98*
D vs PW*	21.00	2.49	8.43**
M vs NRB*	14.10	5.35	2.63
M vs PI*	10.70	5.73	1.86
M vs PW*	22.50	5.43	4.14**
NRB* vs PI	3.40	2.41	1.41
NRB vs PW*	8.40	1.58	5.32**
PI vs PW*	11.80	2.58	4.57**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 34
CRITICAL RATIOS FOR GRADE 12 ON PRESSEY ENGLISH—SECTION C

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	.70	3.15	.22
RB* vs M	3.90	6.54	.60
RB vs NRB*	12.40	1.81	6.85**
RB vs PI*	14.00	2.65	5.28**
RB vs PW*	21.30	1.95	10.92**
D* vs M	4.60	6.04	.66
D vs NRB*	11.70	2.95	3.97**
D vs PI*	13.30	3.53	3.77**
D vs PW*	20.60	3.03	6.80**
M vs NRB*	16.30	6.44	2.53
M vs PI*	17.90	6.73	2.66
M vs PW*	25.20	6.17	3.89**
NRB vs PI*	1.60	2.39	.67
NRB vs PW*	8.90	1.57	5.67**
PI vs PW*	7.30	2.51	2.91

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 35
CRITICAL RATIOS FOR GRADE 12 ON PRESSEY ENGLISH—SECTION D

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	4.70	2.93	1.60
RB* vs M	13.60	6.18	2.20
RB vs NRB*	6.30	1.38	4.57**
RB vs PI*	3.90	2.42	1.61
RB vs PW*	15.90	1.60	9.94**
D* vs M	8.90	6.66	1.34
D vs NRB*	11.00	2.85	3.86**
D vs PI*	8.60	3.46	2.49
D vs PW*	20.60	2.95	6.98**
M vs NRB*	19.90	6.14	3.24*
M vs PI*	17.50	6.45	2.71
M vs PW*	29.50	6.19	4.77**
NRB* vs PI	2.40	2.30	1.04
NRB vs PW*	9.60	1.41	6.81**
PI vs PW*	12.00	2.44	4.92**

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 36
CRITICAL RATIOS FOR GRADE 12 ON ARITHMETIC-FACTOR ABILITIES

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	.08	1.11	.07
RB vs M*	5.16	1.65	3.12*
RB vs NRB*	3.62	.68	5.32**
RB vs PI*	4.20	.91	4.61**
RB vs PW*	5.76	.78	7.38**
D vs M*	5.08	1.82	2.79
D vs NRB*	3.54	1.03	3.44**
D vs PI*	4.12	1.20	3.43**
D vs PW*	5.68	1.10	5.16**
M* vs NRB	1.54	1.59	.97
M* vs PI	.96	1.71	.56
M vs PW*	.60	1.64	.37
NRB vs PI*	.58	.81	.72
NRB vs PW*	2.14	.66	.32
PI vs PW*	1.56	.90	1.73

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 37
CRITICAL RATIOS FOR GRADE 12 ON FREE WRITING-LENGTH

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB vs D*	4.60	9.26	.50
RB vs M*	44.40	12.27	3.62**
RB vs NRB*	23.60	6.24	3.78**
RB vs PI*	.30	8.49	.04
RB vs PW*	9.30	7.94	1.16
D vs M*	39.80	13.65	2.92
D vs NRB*	19.00	8.66	2.19
D* vs PI	4.30	10.39	.41
D vs PW*	4.70	9.99	.47
M* vs. NRB	20.80	11.81	1.76
M* vs PI	44.10	13.14	3.36*
M* vs PW	35.10	12.82	2.74
NRB* vs PI	23.30	7.82	2.98*
NRB* vs PW	14.30	7.27	1.97
PI vs PW*	9.00	9.28	.97

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 38
CRITICAL RATIOS FOR GRADE 12 ON FREE WRITING-ERRORS

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	.90	.61	1.48
RB* vs M	2.73	.69	3.96**
RB* vs NRB	1.95	.38	5.13**
RB* vs PI	2.58	.46	5.61**
RB* vs PW	2.82	.93	3.03*
D* vs M	1.83	.80	2.29
D* vs NRB	1.05	.54	1.94
D* vs PI	1.68	.60	2.82
D* vs PW	1.92	1.00	1.92
M vs NRB*	.68	.63	1.08
M vs PI*	.15	.61	.25
M* vs PW	.09	1.05	.09
NRB* vs PI	.63	.37	1.70
NRB* vs PW	.87	.80	.99
PI* vs PW	.24	.92	.26

*Higher Mean. (More errors).

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 39
CRITICAL RATIOS FOR GRADE 12 ON USE OF RESOURCES

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	1.91	1.75	1.09
RB vs M*	3.42	1.99	1.72
RB vs NRB*	2.85	.82	3.48**
RB vs PI*	4.92	1.00	4.92**
RB vs PW*	4.65	.97	4.79**
D vs M*	5.34	2.45	2.18
D vs NRB*	4.77	1.65	2.89
D vs PI*	6.84	1.74	3.93**
D vs PW*	6.57	1.73	3.80**
M* vs NRB	.57	1.90	.30
M vs PI*	1.50	1.99	.75
M vs PW*	1.23	1.97	.62
NRB vs PI*	.07	.80	.88
NRB vs PW*	1.80	.77	2.34
PI* vs PW	.27	.96	.28

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

TABLE 40
CRITICAL RATIOS FOR GRADE 12 ON HEALTH AND SAFETY

Comparison Between	Difference in Means	S. E. of Difference	Critical Ratio
RB* vs D	.76	.75	1.01
RB vs M*	1.36	1.17	1.16
RB vs NRB*	1.88	.55	3.41**
RB vs PI*	1.40	.77	1.81
RB vs PW*	2.40	.59	4.06**
D vs M*	2.12	1.19	1.78
D vs NRB*	2.64	.59	4.47**
D vs PI*	2.16	.80	2.70
D vs PW*	3.16	.62	5.09**
M vs NRB*	.52	1.12	.46
M vs PI*	.04	1.24	.03
M vs PW*	1.04	1.14	.91
NRB* vs PI	.48	.69	.69
NRB vs PW*	.52	.48	1.08
PI vs PW*	1.00	.72	1.38

*Higher Mean.

**Significant at the 1 per cent level.
*Significant at the 5 per cent level.

An examination of Tables 29-40 reveals that the white children in the public schools achieved significantly more than the Indian children in the:

1. Reservation boarding schools on eleven tests.
2. Day schools on ten tests.
3. Mission schools on five tests.
4. Nonreservation schools on six tests.
5. Public schools on three tests.

Thus, in competition with the white schools, the rankings of the Indian schools in terms of significant critical ratios in order from best to poorest were: public Indian, mission, nonreservation boarding, reservation boarding, and day.

Using the same system of ranking as described previously, the rank order of the types of schools from best performance on all twelve tests was as follows: (1) public Indian, (2) nonreservation boarding, (3) mission, (4) reservation boarding, and (5) day. Although the N was small or five, rank order correlations were computed between the ranks given above and the ranks according to: (1) percentages of children usually speaking **English** as a pre-school language, (2) percentages of children usually speaking an **Indian dialect** as a pre-school language, (3) percentages of children having **all Indian** friends, (4) percentages of children having **mostly white but some Indian** friends, (5) percentages of **fullblood** Indians, and (6) percentages of **halfblood** Indians. The correlations were respectively: .90, —1.00, —.90, 1.00, —.50, and —.20.

●Comparison of Types of Schools by Grade Levels

The rank order correlations between the ranks of the types of schools on the eighth grade level on the tests as a whole and the ranks of the types of schools on the twelfth grade level on the tests as a whole, was 1.00. This indicates that the types of schools were quite consistent in performance on the tests as a whole on the eighth and twelfth grade levels. This tentatively establishes a hierarchy of types of schools with regard to educational achievement.

SUMMARY

The rank order correlations for grade eight and twelve for the various types of schools were considerably higher than those obtained with geographic areas. Although it must be remembered that these correlations with regard to types of schools were based on an N of five, they do make a strong case for the statement: the greater the degree of contact of the Indian child with the white man's culture, the higher he scores on educational tests.

The correlations between the achievement rankings in the eighth and twelfth grades according to geographic area and to types of schools would seem to indicate that the same cultural and educational factors were in operation at both levels. This tentatively establishes a hierarchy of geographic areas and types of schools with regard to educational achievement.

If differences in cultural and educational background will produce differences in educational achievement among Indians, then wider differences in cultural and educational background as they exist between Indian children and white children should produce even greater differences in educational achievement in favor of white children. This proved to be true in some instances in this study. Thus, it seems logical to say, that, as the cultural and educational backgrounds of Indian children become more like those of white children, the more closely will the educational achievement of Indian children match that of white children.

Chapter V

Conclusions And Plans For The Future

EDUCATIONAL ACCOMPLISHMENTS OF INDIAN CHILDREN IN THE VARIOUS TYPES OF SCHOOLS

On the basis of the statistical techniques used, differences in educational accomplishments large enough to be considered significant were obtained between types of schools on each of the tests in both the eighth and twelfth grades.

● Grade Eight

In terms of significant critical ratios, differences in achievement of Indian children in the various types of schools as a group were:

1. Greatest in capitalization, sentence structure, and vocabulary.
2. Apparent in reading to appreciate general significance, arithmetic computation, punctuation, and length of free writing.
3. Few in arithmetic-factor abilities and use of resources.
4. Non-existent in reading to understand precise directions, good usage, and errors in free writing.

In terms of significant critical ratios, white children in the public schools when compared to the Indian children in the various types of schools as a group, were:

1. Definitely superior in good usage, reading to understand precise directions, sentence structure, punctuation, and reading to appreciate general significance.
2. Superior in capitalization, arithmetic-factor abilities, arithmetic computation, and use of resources.
3. Somewhat superior in vocabulary.
4. Somewhat superior in errors in free writing.
5. No better in length of free writing.

● Grade Twelve

In terms of significant critical ratios, differences in achievement of Indian children in the various types of schools as a group were:

1. Greatest in vocabulary, arithmetic-factor abilities, punctuation, capitalization, reading to note details.

2. Were apparent in length of free writing, errors in free writing, use of resources, sentence structure, good usage, reading to predict outcomes of given events, and health and safety.

In terms of significant critical ratios, white children in the public schools when compared to the Indian children in the various types of schools as a group, were:

1. Definitely superior in capitalization, good usage, sentence structure, and punctuation.

2. Superior in vocabulary and reading to predict the outcomes of given events.

3. Somewhat superior in reading to note details, arithmetic-factor abilities, use of resources, and health and safety.

4. No better in length of free writing.

5. Somewhat superior in errors in free writing.

RELATIONSHIPS BETWEEN ACHIEVEMENT AND CULTURAL AND EDUCATIONAL FACTORS

Considerable differences in achievement were noted from area to area and from one type of school to another in both grade eight and twelve with evidence of varying degrees of overlap. The fact that the areas and types of schools were quite consistent in performance on the tests as a whole on both grade levels tentatively indicates that, with regard to educational achievement, a hierarchy of both areas and types of schools seems to exist.

When these hierarchies were used to produce a ranking of areas and a ranking of types of schools, and when these rankings were correlated with rankings on certain cultural and educational factors, correlations were obtained which lend support to the statement: **that as the cultural and educational backgrounds of Indian children become more like those of white children in the public schools, the more closely will the educational achievement of Indian children match that of white children.**

Educational workers in the various areas and types of schools need not be unduly concerned with the relative position of their area or type of school with reference to the others until they have ascertained whether or not the children under their direction had greater or lesser cultural and educational opportunities as compared to children in other areas or types of schools. Even then, differences in teacher competency coupled with other factors operate to produce differences in pupil achievement among Indian children as well as white children.

THE FUTURE

- Tour of the Southwest

In January of 1951, L. Madison Coombs, Education Specialist for the Bureau of Indian Affairs, and Dr. Kenneth E. Anderson of the University of Kansas visited schools throughout the Southwest area with the specific purpose of improving the Indian Testing Service. The following letter of suggestions and recommendations was sent to Dr. Beatty on February 13, 1951:

Dear Dr. Beatty:

After a seventeen-day tour of the Southwest reservations, I am impressed with the vastness and complexity of the whole Indian problem and feel that much more should be done to ameliorate the injustices which have been visited upon these conquered peoples.

If all of the critics of Indian education could have the privilege that Madison Coombs and I have had of a visit to the schools of the Southwest, they would have to agree that Indian education is not without merit. I have developed a profound respect for the excellent work being done in this area. The personnel is of high caliber, and has a professional outlook that warms the heart. While everyone was cooperative, I wish to mention especially the following people who made our tour pleasant and enlightening: Mr. Beggs, Mrs. Bibo, Miss Gould, Mr. Williams, Mr. Warren, Mr. Gray, Mrs. Thompson, Mr. Bramlett, Mr. Carnal, Mr. Wells, Mr. Morelock, Mr. Lundeen, Mr. Ryan, and Mr. Pratt. These people and many others offered constructive suggestions which should be valuable to the testing program. It is my sincere opinion that your people are doing a fine job of making education function realistically for the Indian boy and girl.

In order to increase the scope and effectiveness of your work the following recommendations are made, subsequent to the seventeen-day tour of the schools in the Pueblo, Navajo, Hopi, Pima, and Papago Indian Reservations:

1. A general conference should be held in the spring of 1951, at which representatives of the testing personnel, University of Kansas, and area educationists should:

(a) review the past and present testing program.

(b) consider the testing program in the light of the objectives of Indian education and the minimum essential goals.

(c) select tests from the inventory of existing tests or construct new tests to measure the stated objectives.

(d) develop a blueprint for administering, tabulating, and reporting test data to schools within the several areas.

This phase is separate from the background information sheets used in the past. It is hoped that the schools would, within two months after the tests had been given, have in their hands the essential statistical data and norms necessary for proper interpretation of an individual's achievement in essential subjects.

(e) discuss the guidance possibilities inherent in the new testing program.

2. The basic list of tests for the fundamental subjects should be made up of those tests in which equivalent forms are available, so that identical tests are not used from year to year.

3. Administration of tests for the fundamental subjects should be on a service-wide basis and should occur at approximately the same time each year so that growth in subject matter areas could be measured consistently.

4. Comprehensive plans for the administration, scoring, and reporting of test data should be laid by the area educationists in conferences in their areas prior to the testing week. Standardized forms for reporting and tabulation of data should be used to report data to Haskell. The completed forms should be in the Haskell office within three weeks after the tests are given. The University of Kansas Bureaus (Research and Guidance) would make the statistical computations necessary for proper interpretation of the data. Reports with recommendations for improvement of instruction would then be prepared for distribution to areas and schools.

5. Diagnosis and guidance purposes could be served by the use of transparent acetates. These might display lines to indicate: (a) area norms, (b) reservation norms, (c) day school norms, and (d) boarding school norms. The acetates would be distributed to areas and schools. Thus, by direct comparison, the Indian schools within each area might determine the field, for example arithmetic fundamentals, where greater concentration was needed. This plan should result in an increased vitality of instruction throughout the Indian service. The acetates might also be used with individual students so that more than lip service could be paid to the principle of individual differences.

6. A comprehensive booklet might be prepared for teachers regarding the administration, scoring, use, and interpretation of test results. The booklet should contain many graphic portrayals of the possible uses of test data.

7. Experimental testing should be done on an area basis with members of the testing personnel supervising in such special areas as: (a) home economics, (b) use of natural resources, (c) personality tests, (d) attitude tests, (e) use of tools and appliances in the home, and etc. The results of the tests should be analyzed and compari-

sons made by areas to bring forth any general or basic conclusions regarding Indian education for the future. Research reports in lay language should be prepared and distributed. The first year, the Southwest area might be involved in experimental testing. The next year the Northwest area, and etc.

8. Cognizance of lack of facility with the English language, and certain other factors should be the basis for statistical comparisons of Indians in Indian schools with: (a) white children in public schools, and (b) Indian children in public schools. Comparisons of achievement with pre-test scores held constant to compensate for lack of English comprehension on the part of the Indian child, should be run (analysis of variance and covariance) to determine whether growth in an area of instruction is less, the same, or greater, than for white children in the same grades. This should definitely establish whether or not Indian education is poorer, as good as, or better than the education provided in public schools.

9. Advisement of children in Indian high schools as to future employment and education may be facilitated by developing a battery of tests through an experimental program. For example, the problem of selection of students for the commercial course at Haskell might be attacked through this method.

10. Follow-up studies of Indian children graduating from high school and college should be made to properly evaluate the success of the program. This might be not unlike that now being conducted at the Pine Ridge Reservation.

This letter is written with the hope that some of the recommendations may be carried through for an improved program of Indian education. We are ready to use our personnel and facilities to this end.

Sincerely yours,

Kenneth E. Anderson,
Professor of Education,
Director, Bureau of Educational Research and Service.

● The Intermountain Conference

The conference recommended under (1) in the letter to Dr. Beatty took place on June 15 and 16, 1951. The following resumé of the conference, written by Mr. Coombs, describes in some detail the results of the conference.

PLACE: Intermountain Indian School, Brigham City, Utah.
DATES: June 15 and 16, 1951.
PURPOSE: Planning an evaluation program for Indian education.

CONFEREES: Dr. Willard W. Beatty, Chief, Branch of Education, United States Bureau of Indian Affairs.

Dr. Kenneth E. Anderson, Dr. Gordon Collister and Mr. Carl E. Ladd, consultants to the program from the University of Kansas Bureau of Educational Research and Service, and the Guidance Bureau.

Dr. George A. Dale, Earl C. Intolubbe and L. Madison Coombs, Education Specialists, Bureau of Indian Affairs.

Vernon L. Beggs, George C. Wells, Hildegard Thompson, Louise Wiberg, A. B. Caldwell, Henry Wall, Bertha Ellinger and Russell Kelley, Area Educationists of the Bureau of Indian Affairs or their representatives.

William Clasby, Supervisor of Indian Education for the State Department of Education, Oklahoma.

William Benham, John Carmody and Albert Hawley also sat in on some of the sessions.

In Dr. Beatty's opening statement to the group, he said that it is necessary that the Education Branch carry on a continuous program of evaluation in order to measure its effectiveness in terms of its educational objectives. Findings coming out of such a program serve as the basis for curriculum building, improvement of instruction, etc. It also provides objective evidence with which to answer critics of Indian education when such criticism is inaccurate, unfair or based on false assumptions or incomplete or distorted data. He pointed out that such a program has been in effect for some years, first with the help of the University of Chicago and more recently under the guidance of the University of Kansas and its Bureaus of Educational Research and Guidance. Currently, he said, this program of evaluation is concentrating on two particular points:

1. The effectiveness of our school programs for children while in school.

2. Its effectiveness in the longer run; is there an improved way of life at the post school or adult level for those individuals who have attended Indian schools? This second type of evaluation is exemplified by the Pine Ridge study now in progress. A similar study is being projected for the state of Oklahoma. In addition, the Guidance Bureau of the University of Kansas has been giving tests to Indian young people who are applicants for either educational loans or admission to the Haskell Institute Commercial training course, with a view to predicting success in college, nurses training or post high school vocational training for individuals.

Dr. Beatty also stated that one of our jobs in the near future would be construction of tests to measure achievement in the minimum essential goals.

Mr. Coombs then pointed out that in evaluating the effectiveness of a school system it is necessary to have some basis for comparison. Since Indian Service schools are constantly and inevitably being compared with public schools and mission schools, the evaluative process should include all three types. He said he felt that a careful approach to this type of evaluation was essential and that consideration should be given to:

1. The selection of schools of all three types which were similar to each other in point of the children enrolled, i. e., cultural and language backgrounds, geographic, social and economic environment, etc. Cooperative planning with public and mission school officials would be necessary with a view to all types of schools deriving benefit from the study.

2. Careful concentration on a selected area for the purpose of acquainting school personnel at all levels with the purpose of the study, its probable beneficial outcomes and techniques involved in the administration of tests and the interpretation of their results. If the conferees agreed with this approach, then the area should be decided upon.

3. A decision should be reached as to the grade levels at which testing should be done and the instructional areas in which tests should be given.

Dr. Anderson then stated that as a result of his visit to schools in the Albuquerque, Window Rock and Phoenix areas last January, it was his belief that such a program of achievement testing would serve the general administrative purposes which Dr. Beatty had mentioned earlier and would also serve important educational purposes at the area, reservation and local school level. For example, by the development of local grade norms such as for day schools on a certain reservation or boarding school within a certain area, test results could be made much more meaningful and useful than by the use of national norms. Test results could then be placed in the hands of local school personnel and used for diagnosis of individual pupils' strengths and weaknesses, strengthening of the instructional program, adaptation of the level of instruction, etc., to mention only a few. He said that one technique for doing this type of thing would be explained by Dr. Collister a little later on.

As a result of discussion among the conferees, it was decided that the plan for an intensified program within one area the first year, as outlined above, was wise but the area was not definitely *decided upon. It was the feeling of the group that such a first year's program could serve as a pilot study, with procedures being perfected, but that within the next two or three years, all areas to be included should be brought into the program to lend integration to the program and avoid loss of interest.*

The conferees felt that testing should begin at the third grade level and extend through the twelfth with all pupils in all grades in each of the schools included in the study being tested. It was also agreed that pending the construction of tests to fit specific needs, it would be necessary to select commercial standardized tests which would serve our purposes, plus certain tests already constructed for Indian schools, such as the Use of Resources, Health and Safety, Homemaking and Nutrition tests. Because of the desirability of using the same instrument in all areas, it was agreed that testing should largely be concentrated in the field of the basic skills, namely reading, spelling, language usage and arithmetic, with the United States Indian Service tests named above being used where applicable. The general uniformity of educational goals in the area of the basic skills, in public, mission and Indian Service schools made this seem wise. Selection of specific instruments was deferred until more data were available upon which to base the selection of tests. It was agreed that tests should be developed for the minimum essential goals as soon as possible. Dr. Anderson stressed the desirability of accomplishing this latter purpose at least partially through Bureau of Indian Affairs personnel working on the problem as graduate students at the University of Kansas. Dr. Beatty later indicated that this arrangement might be possible. It was agreed that testing should be done early in the school year in order to make possible the fullest use of the data by local school personnel.

It was recognized that numerous testing programs are now being carried on by schools, reservations and areas. It was Dr. Beatty's feeling that these programs were not always as productive as they should be and that they should be coordinated with the larger program or brought up to a higher level of efficiency with the help of the University of Kansas consultants. In all cases, it was agreed every effort should be made to avoid duplication of effort and to minimize dislocation of the aims of existing testing programs.

At one of the sessions, Dr. Collister demonstrated the technique of using transparent acetate "overlays" showing norms referred to earlier in this summary. These can be placed over individual student profiles or class profiles and provide a graphic presentation of data for analysis purposes.

In discussing the proposed survey of former enrollees of Oklahoma Indian Service and public schools, Mr. Dale gave a brief re-

view of the methods used in the Pine Ridge survey for consideration as a starting point for the Oklahoma survey. The following proposals and questions were raised:

MR. CLASBY: Proposes using school records from selected schools to establish a population for the study; or as an alternate, to take selected areas representing agricultural and industrial sections of the state and working from records of certain high schools within these areas.

He raises the objection that the interview technique tends to produce a negative selection, i. e., many of the more successful students leave the state and cannot be found for interview and will be too busy to answer questionnaires. He is of the opinion that the questions concerning the effectiveness of schools in general is related to poor teaching personnel.

MR. CALDWELL: Raises the question that selection at a given grade level prevents studying the typical enrollee due to the fact that many will already have dropped out before reaching the grade level selected. He proposes selecting samples at given chronological age levels.

Mr. Clasby and Mr. Caldwell are willing to participate in this survey and very generously offered to assist in any way possible in getting the survey started.

DR. COLLISTER: In discussing general procedure and technique of the survey, pointed out the following: that we are missing a good bet in evaluating the effect of our schools if we do not ask the former enrollee (graduate or otherwise) what he thinks of his school experience, for example:

1. What did you expect to do (what goals) when you left school?

2. To what extent have you realized your goals?

3. To what extent did your school experience help you in realizing these goals?

4. What are your present goals, etc.?

Sufficiently intensive study of the above should reveal extent of the culturation.

Dr. Collister also pointed out:

1. Records of reasons for drop-outs probably biased because the student frequently does not give real reason why he dropped out.

2. Student should be asked why he dropped out as he sees the situation now; also the reason for his dropping out as it existed *at the time he dropped out. Was dropping out due to lack of acceptance by the group? (Because of being an Indian, because of low economic status, etc.)*

DR. ANDERSON: If the study is to yield conclusive application to all of Oklahoma, all types of schools should be proportionately represented in the samples selected. Follow each group through high school to find drop-outs and graduates and secure data. Investigator should secure:

1. Personal data—age, number of children, etc.

2. Educational data—college graduate, Haskell graduate, how far in school, etc.

3. Employment—how many jobs, what kinds, relation to education, if any—opinion of enrollee concerning effectiveness of school in preparing for employment.

4. Civic activities—how active as citizen, per cent of participation in community activities, social and political activities, etc.

5. Recreation—type, extent, relationship to school experience, etc.

6. Socio-economic status—income—indebtedness, insurance, etc.

7. Community status—rating by peers, law violations.

At the final meeting, the recommendations set forth above were presented to Dr. Beatty and he expressed general agreement with them. He stated that we might better think of areas in terms of cultural similarities rather than administrative organization for the present purpose, and proposed the following divisions:

1. *Southwest (Pueblo and Phoenix).*
2. *Window Rock (Navajo and Hopi).*
3. *Great Plains (Dakota and Mountain).*
4. *Oklahoma (Muskogee and Anadarko).*
5. *Alaska.*

He felt that the United States Indian Service maintains so few schools, if any, in the Minneapolis, Portland and Sacramento areas as to make it feasible to omit them from the present survey program. After taking all factors into consideration, he proposed that the first study be made in the Southwest Area, (Albuquerque and Phoenix), beginning in the fall of 1951. The conferees endorsed this proposal and Mr. Beggs and Mr. Wells tendered all possible help on the study.

Dr. Beatty also advised the group that an effort was being made to free Miss Mary Mitchell of the Santa Fe Indian School from her present duties in order that she might devote full time for a six-

month period to her research on the Free Writing Test at Haskell Institute in Lawrence, Kansas. He asked Dr. Anderson and Dr. Collister if they would be able to advise her in this research and they indicated they thought it would be possible to do so.

With the understanding that more specific planning must be carried on by the University consultants and Bureau of Indian Affairs personnel during the summer and early fall, the conference was adjourned.

● The Albuquerque Conference

Since the Intermountain Conference recommended that the new testing program be conducted in the Southwest, L. Madison Coombs and the University of Kansas consultants met with the two area educationists and their reservations' principals, supervisors, and teachers. This conference took place September 13 to September 15, 1951. In addition, representatives from the public and mission schools were present since testing was to be done in these schools too.

The fall testing program now in progress in the Southwest will be completed when the profile sheets for the individual pupils together with various acetate overlays are in the hands of the classroom teachers. Thus, each teacher should have in her hands by early in the school year, a picture of the strengths and weaknesses of each pupil under her supervision. Much should be accomplished in the remaining six months to consolidate gains and strengthen weaknesses of Indian children in the basic areas of learning.

Thus, within a period of one year, under the direction of L. Madison Coombs and the University of Kansas consultants, a complete change in emphasis with regard to testing has been effected. If the program now under way in the Southwest proves fruitful, extensions should be made to the other areas as time and personnel permit. As the findings of this study become both known and applied to Indian education and as future developments, already in the planning stage, become realities, the education of Indian boys and girls will definitely prepare them better for living successfully in society.

Bibliography

1. Anderson, Kenneth E. "A Frontal Attack on the Basic Problem in Evaluation." **Journal of Experimental Education,** 18 (March 1950) 163-174.

2. Anderson, Kenneth E. **A Summary Report to the North Central Schools of Kansas on Criterion I.** (Mimeographed Bulletin) School of Education, University of Kansas, 1949.

3. **Review and Preview, Secondary School Studies of Drop-Outs, Hidden Tuition Costs, Junior High Activity Program.** Lawrence Junior High School, Liberty Memorial High School, Lawrence, Kansas. (In cooperation with the School of Education, University of Kansas.) 1950-1951.

4. Edwards, Allen L. **Experimental Design in Psychological Research.** New York: Rinehart and Company, Inc., 1950.

5. Fisher, R. A. **Statistical Methods For Research Workers.** (6th ed.) Edinburgh: Oliver and Boyd, 1936.

6. Johnson, Palmer O. **Statistical Methods in Research.** New York: Prentice-Hall, Inc., 1949.

7. Olds, E. G. "Distributions of Sums of Squares of Rank Differences For Small Numbers of Individuals." **Annals of Mathematical Statistics,** 9 (March 1938) 133-149.

8. Peterson, Shailer. **How Well Are Indian Children Educated?** Lawrence, Kansas: Haskell Institute Print Shop, 1948.

9. Schunert, Jim. "The Association of Mathematical Achievement With Certain Factors Resident in the Teacher, in the Teaching, in the Pupil and in the School." **Journal of Experimental Education,** 19 (March 1951) 219-238.

10. Tompkins, Ellsworth. "Where Are the Boys?" **School and Society,** 70 (July 2, 1949) 8-10.

Appendix

United States Indian Bureau Tests

p. 90 blank

Grades 5-12

Testing Number

Score ....

UNITED STATES INDIAN BUREAU

ARITHMETIC

FACTORIAL ABILITIES TEST

Name .... Boy.... Girl........
First Middle Last

School .... Grade ....

DIRECTIONS:

Do not turn the page until you are told to do so.

This is an arithmetic test. Some of the problems are problems in addition, and some are problems in subtraction. Some are problems in multiplication, and some are problems in division.

Do these sample problems now:

1+5= 7−4= 3×4= 12÷6=

The correct answer for the first problem is 6; for the second, the correct answer is 3. What is the correct answer for the multiplication problem? For the division problem? If you did not get the answer, do the problem again.

You are to solve as many of the problems on the next two pages as you can in the time allowed. Work the easy problems first, and then go back to the hard ones if you have time. Are there any questions?

Test materials taken from Factorial Abilities Test Battery by permission of the authors, Karl J. Holzinger and Frances Swineford, University of Chicago.

Form USIS—FA-A—1-47; Haskell-3-12-47-18M; 4-6-50-10M

p. 92 blank

$7 \times 6 =$

$\begin{array}{r} 52 \\ \times 4 \\ \hline \end{array}$

$30 \div 6 =$

$2\overline{)86}$

$3\overline{)609}$

$4 \times 3 =$

$20 \times 2 =$

$24 \div 6 =$

$\begin{array}{r} 59 \\ \times 7 \\ \hline \end{array}$

$1/5$ of $349.5 =$

$3/5 \div 6 =$

$5/8 \times 2/3 =$

$5/6$ of $465 =$

$24 \div 3/8 =$

$1/16 \times 6 =$

$31\overline{)7874}$

$\begin{array}{r} 78{,}039 \\ \times 487 \\ \hline \end{array}$

$\begin{array}{r} 451\ 1/6 \\ \times 72 \\ \hline \end{array}$

$\begin{array}{r} 86 \\ \times\ 17\ 1/4 \\ \hline \end{array}$

$\begin{array}{r} 3.0728 \\ \times .0195 \\ \hline \end{array}$

$7\overline{)16 \text{ yd. } 2 \text{ ft. } 9 \text{ in.}}$

$64\overline{)24224}$

$\begin{array}{r} 3725\ 1/4 \\ \times 4.06 \\ \hline \end{array}$

$3\,7/9 \div 1\,15/16 =$

$2\,2/5 \times 1\,3/7 =$

6+3=	8+7=	1+3=	32 2	46 58

3+5=	9+6=	53 8	21 54 13

17 29 6	542 716 445 298 643 512	$16\frac{3}{4}+4\frac{1}{2}=$	309.2 513.7 623.9 700.5 138.0

13 702+ 8.6+200 18+9+6.0175=

$\frac{3}{4}+\frac{7}{8}+1\frac{2}{3}+\frac{7}{12}=$

9−3=	67−10=	26 −5	64 −21	786 −422

12−7=	33 −8	51 −16	300−9=

87 −9	465 −137	8923 −1876	$5\frac{1}{2}$ −3

13 $-4\frac{1}{4}$	8.59 − .640032

Grades 4-12

Testing Number

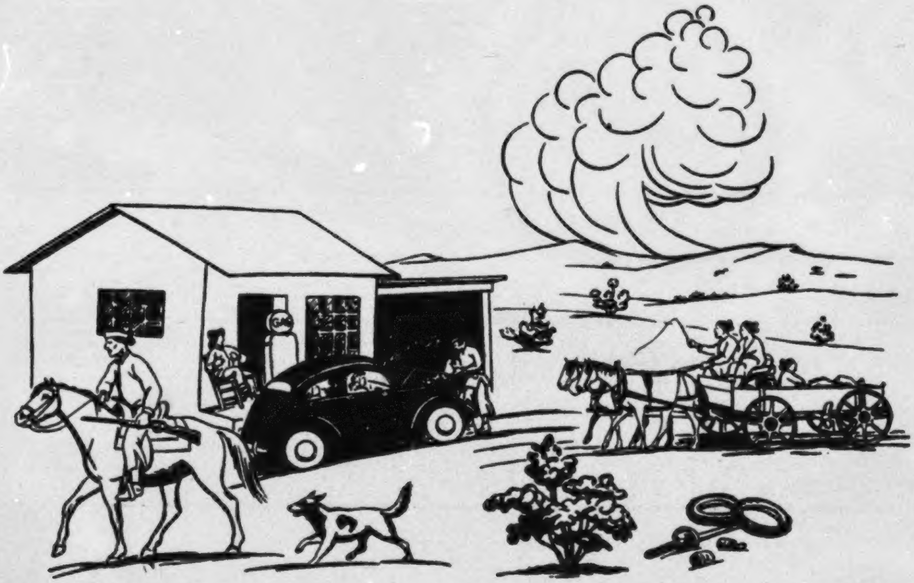
UNITED STATES INDIAN BUREAU

FREE WRITING TEST

FORM C

Name .... Boy .... Girl ....
First Middle Last

School .... Grade ....



USIS-FWA-C-48
Haskell—4-20-48—7M

DIRECTIONS: Write one or more paragraphs telling the story which the picture on the front page sugests to you In this story, be sure that you inlcude something about:

1. The man on horseback with his dog, telling what you think he is going to do.
2. The people in the automobile, telling where they came from and where they may be going.
3. The family in the wagon, telling where they have been or where they are going.
4. Any other things that you wish to include.

WRITE YOUR STORY IN THE SPACE BELOW ON THIS PAGE AND THE NEXT.

FREE WRITING TEST (ALL FORMS)

1) No scoring key is needed. Instead, follow the procedure described below to determine the five scores that are to be recorded.

2) **Length**—Count the total of words in the composition. Pay no attention to errors in making this count. This is the length of the composition, and this number should be entered in the space following L on the back of the booklet.

3) **Errors**—First, mark off with a red or blue pencil the 60 words that are to be scored for errors. These 60 words should begin with the **second line** that the student has written. Beginning at the beginning of this second line, count the next 60 words that the student has written, and mark these off with short vertical lines. Then count the number of errors that appear in these 60 words. A guide to kinds of errors is given below. If a student has not written 60 words, it will be necessary to adjust his error score for length. This is explained below.

TYPES OF ERRORS

1. SPELLING

1) Each misspelled word is considered an error. Do **not,** however, count as an error the repetition of a misspelling. For example, if the student writes "recives" for "receive" twice in the 60 words, this is counted as only one error.

2. CAPITALIZATION

Omitted beginning of sentence
Ex. **h**e is going hunting.
Omitted beginning of direct quotation
Ex. She said, "**b**ring me a deer."
Omitted proper noun or pronoun
Ex. **m**ary and **i** . . .
Omitted nationality, race or language
Ex. **i**ndian; **e**nglish
Omitted days of the week, months of the year
Ex. **s**aturday, **j**une

Wrongly used common nouns
He brought a **D**eer.

Wrongly used Pronouns
Ex. He told **H**er to come back

Wrongly used miscellaneous
Ex. He **R**odeaway. The dog is **B**ig

Omitted titles of respects, reference to deity
Ex. He asked the **g**reat **s**pirit . . .
chief Wahoo

3. COMMA

Omitted before or after a direct quotation
Ex. He said * "I will come soon."
Omitted between city and state
Ex. Gallup * New Mexico
Omitted dates
Ex. January 6 * 1945
Omitted words, phrases or clauses in a series
Ex. a beautiful * white horse.
Omitted dependent clauses
Ex. As he went * she watched him.
Omitted Parenthetical elements, appostives, etc.
Ex. Come back * father * as soon as you can

Wrongly used Miscellaneous
Ex. The girl is playing**,**.

Wrongly used Comma Splice
Ex. The man is going**,** He is on a horse.

Wrongly used between subject and verb
Ex. The faithful pony**,** carried on

Wrongly used To separate adjective from noun
Ex. a big, white**,** horse.

Wrongly used To mark a trivial pause
Ex. The dog ran**,** on into the woods.

4. PERIOD

Omitted abbreviations
Ex. Mr * and etc *
Omitted end of sentence
Ex. He is going *

Wrongly used miscellaneous: at end of each line
Ex. He rode to the**.**
hills on his horse**.**
early in the morning.

5. OTHER PUNCTUATION

Omission of interrogation point after direct question
Ex. She said, "May I go."

Omission of quotation marks before or after direct quotation
Ex.The man said, I am going.

Omission of apostrophe to denote possession
Ex. His horse * is name is.
The girls mother. . .

Omission of apostrophe in contraction
Ex. He can * t go.

Omission of hyphen in compound words
Ex. Her father * in * law

Omission of hyphen in division of words at end of line

Omission of semi-colon, colon, or exclamation mark
Ex. She was a kind mother, she was good to her children.

Wrongly used interrogation point after declarative sentence or indirect quotation.
Ex. They are going to eat meat?
She asked if she go?

Wrongly used quotation marks to set off indirect quotation, of wrongly placed
Ex. She is telling him" to come when he. . .

Omission of Quotation marks-miscellaneous
Ex. (slang expressions - "feller *)

Wrongly used apostrophe-misplaced or to form plurals, etc.
Ex. He go,s. He brought rabbit's

Wrongly used hyphen in compound words, etc.
Ex. I am going to-day.

Wrongly used hyphen in dividing words at end of line
Ex. He is st-
anding outside.

Wrongly used semi-colon, colon, or exclamation mark.
Ex. Wishing him luck; on his journey.

6. SENTENCE STRUCTURE

Omission of noun or pronoun
Ex. The little —— is here.

Sentence fragments
Ex. (He rode away.) **As the sun set.**

Excessive use of and, then, so, but to connect short sentences or words in a series.
Ex. **She went in the house and she helped her mother and the boy** ......

Repetition of words
Ex. He will **soon** be back **soon**.
He said, "I am going now," **he said.**

Excessive use of and, then, so, but
Ex. **And** he went. **And** he shot a deer

Run-on sentences
Ex. He went off and she waved at **him he** caught two **foxes they** were big.

Awkward, dangling or unparallel structure. Inverted word order.
Ex. **She will cook meat for supper to eat. He is going hunting for his family. He will be gone two days which will consist of village men. The boy was something doing.**

Irrelevant words introduced
Ex. wearing **a** some
The girl **she** said
He will return **back**.

7. VERBS

Shifting tense within sentence
Ex. They **came** and begin ....
He **saw** a rabbit and **chases** him.

Past tense and past participle confused
Ex. They had **came.** He **seen.**

Agreement of subject and verb in person and number
Ex. The boy **sit** ....
The house **have** ....

Omission of "ing" ending.
Ex. He went hunt——

Confusion of tense, participle and verb forms (Miscellaneous)
Ex. to return**ed**; he **is** return.
he will **brought**. I will **went**.

Omission of "to" or use of "and" with infinitive
Ex. ....something for them —— eat. Try **and** come soon

Omission of verb or auxilliary
Ex. He hunting for deer.
She —— her hand.
She —— waving her hand.
Ex. set for sit; got for has, etc.

Wrong verb form

8. NOUNS AND PRONOUNS

- Singular noun for plural
  - Ex. He brought two **rabbit**.
- Agreement of pronoun with antecedent in person and number
  - Ex. He will shoot animals and bring **it** back.
- Interchange of pronoun and demonstrative adjective
  - Ex.**Them** hills are ....
- Interchange of possessive and other cases of pronouns
  - Ex. **Him** daughter is ....
  - **He** dog ran.
- Plural noun for singular
  - Ex. equipment**s**; men for man, etc.
- Agreement of pronoun with antecedent in gender.
  - Ex. The girl said to **his** father ....
- Interchange of accusative and nominative
  - Ex. **Her** and her brother stayed home.
  - **Him** and his family ....
- Confusion of who, whom; what, which; who, which
  - Ex. everything **what** he
  - the girl **what**

9. ADJECTIVES AND ADVERBS

- Confusion of adjectives and adverbs
  - Ex. so **terrible** low
  - She did it **good.**
- Confusion of superlative and comparative
  - Ex. **early** than usual
  - **hardest** of the two

10 PREPOSITIONS AND CONJUNCTIONS

- Confusion of preposition and conjunctions
  - Ex. looks **like** they have
- Omission of preposition or conjunction
  - Ex. He is riding —— the mountains.
- Wrong preposition
  - Ex. The girl stood **on** the side if the ....
  - ....riding **in** the horse's back.

11. MISTAKEN IDENTITIES

- then instead of than
- to, too, two
- they, there, their
- Misuse or omission of article
  - Ex. He went for a meat.
  - .... close to ground.

miscellaneous:

new, knew; here, hear; are, our, or; by, buy; dear; deer; is, his, has; were, where; when, want, went, won't; bought, brought; her, here; thing, think, thank; alone, along; off, of; no, know; fine, find; well, will; etc.

12. DOUBLE NEGATIVES

Ex. He hasn't **no** food.

Each error should be identified on the student's booklet by underlining it with a blue or red pencil. Count every error that appears (with the exception of repetition of misspelled forms.) For example, if a student omitted the two commas needed to mark off an appositive, both ommissions are counted as errors. Find the total number or errors of all types that appear in the 60 words and enter this number on the back page in the space following E.

If a student has written less than 60 words, beginning with the second line, it will be necessary to adjust this score for length. Do this by finding the number of errors that actually appear and **increasing** it in proportion to the number of words actually being scored for errors. For example, if a student made 6 errors in the words being scored, and if the number of words being scored is 30, the error score would be two times 6, or 12. If he made errors in 45 words, his error score would be 7 plus one-third of 7, or 9. **Always round these to the nearest whole number.**

4) Quality of Sentence Structure—Examine the 60 words scored for errors and determine a score for quality of sentence structure according to the following scale:

Score

0 No evidence of any attempt to write sentences
1 Uses only simple sentences with a few modifiers
2 Uses simple sentences but their complexity is increased by the use of phrases, etc.
3 Uses either compound or complex sentences. The compound sentences should represent intergation of statements rather than merely stringly simple sentences together with "and."
4 Uses a variety of sentences, including both compound and complex.

Scoring the quality of sentence structure demands a judgement on the part of the scorer. Agreement between at least two judges should be secured in scoring this section. Enter the score (0, 1, 2, 3, or 4) in space following SS on back of the student's booklet.

5) **Quality of Punctuation**—Determine the total number of different kinds of punctuation the student uses in the 60 words scored for errors. Count each different kind used, regardless of whether or not they were used correctly. If no punctuation is used, the score is 0. If only one kind, such as the period, is used, the score is 1. If two different kinds are used, the score is 2. And so forth. Enter this score in the space following P on the back of the student's booklet.

6) **Word Complexity**—Examine the 60 words scored for errors, and count the total number of **different words of more than one syllable** that the student used. Do **not** count repetitions of the same word. On the other hand, do count words of more than one syllable that are incorrectly spelled or used. Enter this score in the space following w on the back page of the student's booklet. **Do not use spaces after v, x, y, or z.**

7) **Checking the Scoring**—It is important that the scoring of this test be carefully checked. The best practice is to have two different persons determine all five scores independently. If there is disagreement, then they should resolve their differences, in accordance with their interpretation of these scoring instructions. Reputable dictionairies and English handbooks should be consulted when two persons disagree on correct forms. There may be many disagreements with respect to the acceptability of certain usages. Split infinitives constitute a good example. In general, follow the more recent standards of style, which, for example, accept split infinitives so long as they do not introduce a confusion in meaning.

8) **Entering the Scores**—Enter the five scores in the appropriate spaces on the Background Information on Sheet.

TESTS IN RURAL PRACTICES

USE OF RESOURCES

Fill in the following blanks:

NAME______________________________ AGE LAST BIRTHDAY____
First Name Initial Last Name

BIRTHDAY____________________ DATE OF TEST____________________
Month Day

SCHOOL______________________________ GRADE______

HOME ADDRESS ______________________________

EXAMINER____________________ TEACHER____________________

SCORE__________

FORM:
USIS-3-46
[illegible]

USE OF RESOURCES

Timber, farm lands, coal, oil, mines and wild life are called natural resources. Nature has given us these things to help us make a living.

DIRECTIONS: This test is made up of a number of items about some of these resources. Each item has four possible answers. Choose the best answer in each item and place a check beside it Check only ONE answer in each item.

PART A

1 A person who understands the nature and importance of natural resources, knows that
______ A. the man who owns these resources should be allowed to use them or sell them as he wishes.
______ B. all resources should be owned and controlled by the government.
______ C. the one who owns them should use them so that they will continue to produce for many years to come.
______ D. the one who owns timber or other resources should sell all of it whenever the price is high or the need is great.

2 The money received from the sale of natural resources should be
______ A. divided equally among the owners.
______ B. used to build a large community building.
______ C used to buy a herd of cattle to feed and sell on the market.
______ D. used to buy land or other resources of continuing value.

3. Irrigation is the method by which water is carried and applied to the soil. Irrigation will
______ A. make sure of a good crop every year
______ B. provide water when it does not rain.
______ C. make it easier to farm the land.
______ D help control weeds and insect pests.

4. Weeds rob the soil of plant food and cut down the yield of crops. The best method to control harmful weeds on crop land is to
______ A. pasture the fields with sheep, goats or cattle.
______ B allow the fields to stand idle without cultivation every other year.
______ C. pull up all of the weeds that have gone to seed and burn hedges and fence rows.
______ D. plant clean seed, cultivate thoroughly, and change crops from year to year.

5. The greatest loss to farmers from insect pests results from the fact that insects
______ A. make much extra work for the farmer.
______ B. annoy the livestock and keep them from feeding.
______ C. reduce the amount and quality of farm and orchard crops.
______ D. cause the farmer to spend a great deal of money to control or destroy them.

6. Insects which harm garden or fruit crops will best be held in check when
______ A. man leaves them to their natural enemies.
______ B seeds are planted at greater depth.
______ C. sprayed or dusted with insect poison.
______ D. fields are cultivated regularly and frequently.

7. Less of the top soil of cultivated land will blow away during heavy winds when
______ A. contour plowing is practiced.
______ B. every other strip of land is always covered with a growing crop.
______ C. whole fields are covered with the same type of crops.
______ D crops are changed from year to year.

8. Clover and alfalfa should be included in farm crops because they
______ A. yield more feed than any other crop.
______ B. build up the soil more than any other crop.
______ C. always make a crop in dry years.
______ D. can be harvested when there is little other farm work.

9. Indians used to bury a fish in every hill of corn to
______ A. observe a religious practice of the tribe.
______ B. make the seed sprout more quickly.
______ C. get rid of spoiled fish.
______ D fertilize the hill of corn.

10. Growing plants require food. They get this food from the soil in which they grow. If crops are to be planted year after year on this land, food must be returned to the soil. In your area this could be done by
______ A. spreading barnyard manure or commercial fertilizer on the fields.
______ B allowing the land to lie idle every other year.
______ C. allowing no weeds to grow on the field.
______ D. burning straw and stubble on the ground after harvest.

11. Top soil will be prevented from washing away when
______ A. a cover of protective growing plants is kept on the soil whenever possible.
______ B. crops are planted in straight rows running from the top of the hill to the bottom.
______ C. a prayer stick is planted in the middle of the field.
______ D. hillside fields are planted to cultivated crops year after year.

12. A farmer or rancher would be wise to lease his farm or grazing land only when
______ A. he has several small tracts of land widely separated and unprofitable to operate.
______ B. it can be rented to a friend.
______ C. the owner needs an income.
______ D the land cannot be used for crop farming.

13 Native pasture grasses are destroyed when
______ A. the grass is cut for hay each year.
______ B. livestock keeps the grass cropped too close to permit reseeding.
______ C heavy winter snows cover the grass for long periods of time.
______ D. rainfall in any one year is less than the average amount.

14. A pure bred sire should be used in a livestock program because
______ A. all offspring could then be registered as full-bloods.
______ B. the off-spring will be hardier and better adapted to the country.
______ C. the off-spring will be likely to have a higher market value or produce more income.
______ D that will guarantee 100 per cent yield of offspring.

15 Every grain farmer should keep a flock of poultry because it will
______ A. produce eggs and meat throughout the year
______ B. yield a very large income throughout the year
______ C. provide interesting and pleasant work for the younger members of the family.
______ D live on table scraps alone.

16. When the amount of annual rainfall is from 10 to 20 inches conditions are usually well suited for
______ A. general farming and dairying.
______ B. stock raising and dry farming.
______ C. fruit growing and gardening.
______ D. no production of any kind.

17 Birds should be given shelter and protection in farming areas because
______ A. they feed on weed seeds and insects that are harmful to crops.
______ B. they can be killed to supply meat for the farmer.
______ C. they help carry seeds from place to place
______ D. they migrate to warmer countries in the winter

18 Sources of water supply give us drinking water, irrigation, and power These sources should be controlled by
______ A. the individual who owns the surrounding land.
______ B. a company of private businessmen organized for profit.
______ C some agency of the government or community
______ D the people who first discover it

19 Mineral and oil resources should be
______ A. used up as rapidly as possible while the need is great and the prices are high.
______ B left in the ground so that the next generation may enjoy their use.
______ C taken from the ground only as long as large scale production is profitable.
______ D taken out of the ground under regulations that will prevent waste and insure a supply for future needs.

20 The main reason each state has game laws is to
______ A. provide an income for the state from license fees.
______ B. supply hunting for sportsmen.
______ C. prevent birds and wild animals from becoming scarce.
______ D provide food for the Indians.

PART B

21 One of the best reasons why a person would want to be a rancher or farmer is because
______ A. he enjoys the work and gets a living from his labor
______ B. he doesn't have a boss over him.
______ C. there is always good money in it.
______ D. all ranchers or farmers are successful men.

22. Planting a different crop each year is a good practice because
______ A. you can grow a larger variety of things.
______ B. it is less work.
______ C. it saves and returns plant food to the soil.
______ D. it brings a larger cash income each year.

23. If you were to examine different kinds of soil under a microscope, the type which would appear to have the largest particles is
______ A. Sandy soil.
______ B. Loams.
______ C. Clay.
______ D. Humus.

24. When purchasing vegetable seeds, it is important to consider the
______ A. amount of seed received for the price.
______ B. reputation of the seed house.
______ C. size of the vegetables as shown on the package.
______ D. size of the seeds in the package.

25. For the purpose of control, harmful plant insects are classified as
______ A. large and small.
______ B. flying and crawling.
______ C. chewing and sucking.
______ D. hard and soft shell.

26. The tools which one would use in making a wooden box are
______ A. Hammer, plane, cold chisel.
______ B. Screw driver, brace, bit.
______ C. Hammer, square, saw.
______ D. Saw, nails, wrench.

27. To get the best information about farming and grazing, one should write to the
______ A. governor.
______ B. state agricultural college.
______ C. United States Weather Bureau.
______ D. state department of education.

28. Before you use a farm implement the first time, you should have someone show you how to operate it because
______ A. it will save you time.
______ B. you can do a better job with less chance of damage to the implement.
______ C. directions are very seldom found on implements.
______ D. you would never be able to find out for yourself.

29. A farmer or a businessman can find out if he is making money or losing money, if he
______ A. sells his products in the fall.
______ B. keeps complete records of the prices of what he buys and sells.
______ C. gets information from his friends.
______ D. asks the farm agent.

30. Garden seed should be planted at such a time that when the young plants appear, they will not be in danger from a
______ A. heavy hailstorm.
______ B. severe drought.
______ C. early rain storm.
______ D. late frost.

31. The age at which pigs should be weaned is
______ A. two to four weeks.
______ B. six to eight weeks.
______ C. three to four months.
______ D. six to eight months.

32. If a rope running through a pulley breaks, the best way to repair the break would be to
______ A. tie the two broken ends together with a square knot.
______ B. buy a new rope.
______ C. splice the two ends together with a long splice.
______ D. tie the ends together with baling wire.

33. Farm machinery will last longer if it is
______ A. used by neighbors and friends.
______ B. owned by several people.
______ C. left out in the rain and snow.
______ D. kept greased, repaired, and under shelter.

34. Lumber is generally bought by the
______ A. board foot.
______ B. square foot.
______ C. cubic foot.
______ D. square yard.

35. Grain is generally sold by the
______ A. bushel or hundred weight.
______ B. quart or gallon.
______ C. sack or wagon load.
______ D. cubic foot or square foot.

36. One of the best ways to have proof that you have purchased something is to get a
______ A. bill of sale or receipt.
______ B. commission or discount.
______ C. money order or cash.
______ D. write your name on it.

37. If feed can be raised or is cheap, one or more hogs would be desirable for family use in order to
______ A. provide cash when needed.
______ B. provide meat and lard.
______ C. keep snakes away from the house.
______ D. eat table scraps and garbage.

38. When training a horse to be ridden, one of the things a person should do is to
______ A. whip him until he gives up.
______ B. hobble or tie his front legs.
______ C. treat him kindly but firmly.
______ D. keep feed and water from him until he obeys.

39. A few sheep on a small farm
______ A. will make the farmer a lot of money.
______ B. will furnish work for the children.

______ C. will eat many plants left by other livestock and produce a regular income.
______ D. will make nice pets.

40 To control lice on hogs it is best to
_____ A. dip the hogs in a vat of disinfectant.
_____ B. brush the hogs frequently with a stiff brush.
_____ C. place an oiled sack on a post where the hogs can rub against it.
_____ D. see that hogs' rations contain plenty of minerals.

41. Pink eye is a common disease of
_____ A. sheep.
_____ B. hogs.
_____ C. cattle.
_____ D. chickens.

42. When judging beef cattle, the most important qualities are:
_____ A. slow, quiet and easily handled.
_____ B. low set, compact, and squarely built.
_____ C. will pasture easily on open range.
_____ D gives a fair amount of milk for the family.

43. Pullets that grow slower than others in the flock should be
_____ A. kept for layers.
_____ B. culled and eaten at home or sold.
_____ C. trained for shows.
_____ D. mixed with other breeds.

44. Potato beetles can be killed by
_____ A. spraying or dusting the leaves of the plant with poison.
_____ B. spraying or dusting the beetles themselves with poison.
_____ C. setting traps for them.
_____ D. having a flock of crows in the potato field.

45. An animal dies from disease A good way to get rid of the body would be to
_____ A. drag it to some low place and cover it with rocks.
_____ B. sell it to one of the neighbors.
_____ C. leave the body for the coyotes and birds.
_____ D. dig a hole next to the animal, roll the body in and cover it up with dirt and rocks.

46. The age of a yearling horse or cow is about
_____ A. 12 months.
_____ B. 18 months.
_____ C 24 months.
_____ D. 36 months.

47. The breed of beef cattle which has a white face is:
_____ A. Shorthorn.
_____ B. Angus.
_____ C. Hereford.
_____ D. Calloway.

48. Cattle are branded to
_____ A. indicate their breed.
_____ B. show what state they are from.
_____ C. show who owns them.
_____ D. provide training for boys.

49. Instruments should be disinfected before vaccinating each animal in order to
______ A. practice what was learned in school.
______ B. abide by the law of the range.
______ C. prevent infection and the spread of disease.
______ D. keep the cattle from dying.

50. The future of the farming and ranching industry will generally be good because.
______ A. more people are engaged in it than in any other industry.
______ B. there is an abundance of farming and grass land still not in use.
______ C. many young men are being trained to become farmers and ranchers.
______ D. people everywhere must depend upon the products of farms and ranches.

51. The goat is a practical and useful animal for a family because it
______ A. lives on rags and trash around the house.
______ B. gives more milk than a dairy cow.
______ C. produces wholesome milk on a small amount of feed.
______ D. protects sheep.

52. Windows in a hen house should be placed so that
______ A. sunlight will strike every part of the floor sometime during the day.
______ B. part of the floor will be dark at all times.
______ C. chickens will have fresh air blowing on them during the day.
______ D. chickens can get out in case of fire.

53. A farmer insured his crop. It was later destroyed by hail. When he tried to collect money for the damage, the company told him that his policy did not protect the crop against hail. The farmer should
______ A. sue the company for enough money to pay the damage.
______ B. buy insurance from another company.
______ C. form the habit of reading and understanding a paper before he signs it.
______ D. write his Congressman, asking for a change in the law.

54. In butchering animals it is important to bleed them freely so that
______ A. the meat will cure properly and not spoil so easily.
______ B. the meat can be cut up more easily.
______ C. the meat will be more nourishing.
______ D. the animal will die quickly and the butchering can be done faster.

55. For a vegetable garden, one should select a plot that is
______ A. protected from grasshoppers and stray horses.
______ B. fertile and near water.
______ C. level and near the house.
______ D. easy to cultivate.

56. Cattlemen with small herds should cooperate in shipping cattle because it is
______ A. more fun to ship large numbers.
______ B cheaper for each cattleman.
______ C. necessary to fill each stock car.
______ D. an opportunity for neighbors to work together.

57. Each rural family should have a garden because
______ A. the children can learn all about agriculture.
______ B. it will add to the looks of the farm.
______ C. the neighbors always have a garden.
______ D. it will supply the home with fresh vegetables.

58. In raising livestock it is very important to keep the barn or pens clean and sanitary because
______ A. animals like to live in clean places.
______ B. barns and yards are made more attractive.
______ C. there are laws against dirt and filth.
______ D. this keeps the animals healthier.

59. The best way to learn farming and ranching while at school is to
______ A. take part in agriculture projects.
______ B. learn by talking to other students.
______ C. make a written or oral report once a week.
______ D. listen to the teacher.

60. The best way to clean milk cans and buckets is to
______ A. scrub them with soap and water.
______ B. wash and put them in the sun to dry.
______ C. use a strong disinfectant on them.
______ D. wash in cold water, rinse in scalding water and put in the sun to dry.

PART C

61. The money received from the sale of natural resources should be
______ A. used to pay for the cost of a fair or rodeo.
______ B. used to buy land or other resources of continuing value.
______ C. used to buy a herd of cattle to feed and sell.
______ D. used to build a large community building.

62. The purpose of irrigation is to
______ A. provide water for crops.
______ B. furnish water for homes.
______ C. make it easier to farm the land.
______ D. give work to more people.

63. Weeds cause greatest loss to agriculture by
______ A. providing food for prairie dogs.
______ B. providing a home for insects.
______ C. increasing erosion.
______ D. using food and moisture needed by planted crops.

64. Heavy winds will blow away less of the top soil of cutivated land if
______ A. a different crop is planted each year.
______ B. strips of tall growing crops are planted next to row crops.
______ C. the same crop is planted all over the field.
______ D. there is lots of bare land between rows of growing plants.

65. Over a period of years, a herd of cattle can be improved best by
______ A. feeding them alfalfa hay.
______ B. killing the slow-growing or stunted calves.
______ C. selling the calves while they are young.
______ D. using purebred bulls.

66. In an area where the soil is good but there is little rainfall the conditions are usually suited for
______ A. general farming and dairying.
______ B. stock raising and dry farming.
______ C. fruit growing and gardening.
______ D. no production of any kind.

Grades 7-12

Testing Number

A.......................
B.......................
C.......................
T.......................

UNITED STATES INDIAN BUREAU
HEALTH AND SAFETY
FORM A

Name .... Boy .... Girl ....
First Middle Last

School .... Grade ....

DIRECTIONS:

This test is made up of three parts. Each part contains a number of items about health or safety. Each item has four possible answers. Choose the best answer in each item and place a check beside it. Check only ONE answer in each item. As soon as you have finished one part of the test, go on to the next part of the test. Do not stop until you have finished the entire test.

Revised edition, Health and Safety, Tests in Rural Practices, USIS-45.

Materials selected, revised and prepared by Chester Harris, University of Chicago, Frances S. Cushman, Supervisor of Education, and Edna A. Gerken, Supervisor of Health Education, United States Indian Bureau, February, 1947.

Form USIS—HS-A-'47

PART A

1. Typhoid is the name of
....a. a disease.
....b. a part of the body.
....c. an animal.
....d. an operation.

2. If you plan for the ventilation of your house, you plan to
....a. paint it.
....b. tear it down.
....c. provide for fresh air.
....d. keep it clean.

3. One way of taking exercise is to
....a. rest.
....b. sleep.
....c. eat.
....d. walk.

4. If a child has measles, he has a
....a. new toy.
....b. vaccination.
....c. mean temper.
....d. sickness.

5. If bleeding is held in check, the bleeding will
....a. start.
....b. spurt.
....c. wreck.
....d. stop.

6. Baking soda is a kind of
....a. pan.
....b. powder.
....c. grease.
....d. cover.

7. When you loosen a bandage, you make it
....a. tighter.
....b. larger.
....c. less tight.
....d. neater.

8. A fly has just been hatched, it has just
....a. died.
....b. fallen.
....c. been killed.
....d. been born.

9. A boy who is careless about coughing does not
....a. comb his hair.
....b. wash his face.
....c. cover his mouth.
....d. care to go.

10. If a person has been vaccinated, he has been treated to
....a. make him sick.
....b. keep him from having a disease.
....c. cure his disease.
....d. make him hungry.

11. The patients in the hospital are the
....a. doctors.
....b. people who are sick.
....c. people who come to visit.
....d. nurses.

12. A bandage which is sterile is always
....a. white.
....b. large.
....c. free from germs.
....d. free from holes.

13. If a boy is healthy, he is
....a. wealthy .
....b. sick.
....c. well.
....d. helpful.

14. A dentist is one who
....a. comes to see you when are sick.
....b. looks at and takes care of your teeth.
....c. always pulls your teeth out.
....d. gives you medicine to take.

15. A contagious disease is one that
....a. makes sores on the skin.
....b. cannot be passed from a sick person to a well one.
....c. is "catching" or can be passed from one person to another.
....d. is always spread by mosquitoes.

16. The X-ray is a machine which
....a. prevents disease.
....b. causes a big explosion.
....c. helps to cure tuberculosis.
....d. takes a picture of the inside of the body.

17. When a person has fever, it means
....a. his body is hotter than normal.
....b. his tongue is coated with white.
....c. he always has a disease which is "catching."
....d. he has been working too hard.

18. A druggist is trained to
....a. sell ice cream sodas at a drug store.
....b. tell you the kind of medicine you should take when you are sick.
....c. sell medicine at a drug store.
....d. help drag logs in a logging camp.

19. If you prevent something you
....a. make sure it will happen.
....b. try to make it happen.
....c. want it to happen.
....d. keep it from happening.

PART B

1. If there is only one window in a room, the best way to ventilate the room is to open the window
....a. only from the top.
....b. only from the bottom.
....c. from either the top or the bottom.
....d. form both the top and the bottom.

2. The best way to take care of the ears is to
....a. clean them with a toothpick every week.
....b. leave them entirely alone unless you have an earache.
....c. wash them everyday with a soapy wash cloth on a finger and dry them carefully.
....d. put cotton in them before going to bed.

3. The best way to rid your hair of head lice is to
....a. wash the hair with strong soap and water, then dry it in the sun.
....b. dust the hair with 10% DDT, then wash after 10 days.
....c. wash the hair with a DDT solution.
....d. wash the hair with mild soap or shampoo once a week and use hair tonic everyday.

4. One of the most healthful forms of exercise for boys and girls is
....a. setting up exercises in their own rooms.
....b. working on a farm.
....c. playing outdoors with other boys or girls.
....d. sweeping the floor of the house.

5. The reason brushing the teeth is a good daily practice is that it
....a. makes the teeth shine.
....b. prevents all tooth decay.
....c. makes a dentist's service unnecessary.
....d. removes food particles and germs from the teeth.

Go on to the next page.

6. In feeding a small well child you should

....a. let him eat whatever he wants to.

....b. feed him the same food you eat.

....c. learn from a teacher, doctor, or nurse what a child of his age should eat.

....d. feed him what the grocer recommends.

7. A field or public health nurse is supposed to

....a. go to homes and examine sick people.

....b. teach people how to keep well.

....c. decide what medicine sick people need.

....d. give medicine free of charge.

8. A child's first vaccination for smallpox should be

....a. when an epidemic starts.

....b. when he is ten years old.

....c. during his first year of life.

....d. when he starts to school.

9. One disease which can be prevented by giving "shots" is

....a. mumps.

....b. cancer.

....c. malaria.

....d. diptheria.

10. When your friend has a bad cold, the safest thing for you to do is to

....a. stay indoors and play games with him.

....b. ask him to go for a walk with you.

....c. go to the movies with him.

....d. stay away from him.

11. A baby is likely to become sick if he

....a. eats food which flies have been on.

....b. gets too much fresh air.

....c. drinks water which has been boiled.

....d. sleeps 16 hours a days.

12. The common housefly is usually hatched in

....a. still water and swampy places.

....b. manure and garbage piles.

....c. rivers and creeks.

....d. houses and cellars.

13. Mosquitoes can be kept from growing in ponds by

....a. putting oil on the water.

....b. putting salt in the ponds.

....c. letting weeds grow in the ponds.

....d. throwing lime in the water.

14. The best location for a well is

....a. at the foot of the hill on which the house stands.

....b. any place near the barn.

....c. on any spot that is convenient to the house.

....d. on ground that is higher. than the surrounding land.

15. Cooked meat and cooked vegetables should be cooled and then kept

....a. uncovered in clean, cool, damp cellars.

....b. in the sunlight in an uncovered dish.

....c. covered in a clean, cool, dry place.

....d. covered in a warm, dry closet.

16. Each contagious disease is caused by

....a. flying dirt.

....b. certain kinds of flies.

....c. its own kind of germs.

....d. any kind of germ.

17. Drinking water for use in the home should be kept in

....a. an open pail on the floor.

....b. a covered container on a table or shelf.

....c. an open pail on a table or shelf.

....d. an open barrel on top of the house.

18. A boy became ill with typhoid fever. It is most likely he got the typhoid germ from

....a. breathing night air.

....b. water that he drank.

....c. working too hard.

....d. bathing too often.

19. If a person has measles and goes out before he is fully recovered, he is likely to

....a. feel no bad effects.

....c. gain strength more rapidly.

....d. get a more serious sickness.

....b. lose his hearing or eyesight.

20. The best treatment for tuberculosis is

....a. plenty of exercise in the open air.

....b. a program of regular hours of work and a balanced diet.

....c. rest in bed, plenty of wholesome food and good medical care.

...d. the use of home remedies and store medicine.

21. If one receives a small burn, the best thing to do is to

....a. hold the burned place over the stove to draw the heat out of it.

....b. cover the burn with baking soda and water paste and put a bandage over it.

....c. pay no attention to it and allow it to heal by itself.

....d. paint the burn with iodine.

22. Trachoma is sometimes spread from one person to another by

....a. using the same towel.

....b. coughing.

....c. losing sleep.

....d. looking at the sun.

23. Oily dust rags should be kept

....a. in a cupboard with other cloths.

....b. in a covered metal can.

....c. in a pile with other cleaning rags.

....d. by a warm fire.

24. Milk should be put in cans or bottles that have been

....a. washed and rinsed in cold water, then left in the sunshine.

....b washed and rinsed in cold water, dried in the house, then covered.

....c. washed and rinsed in scalding water, dried in the sunshine, then covered and put in a special room.

....d. washed in cold water, rinsed in scalding water, dried in the sunshine and left in the sunshine until they are used.

PART C

1. Garbage or other kitchen and table waste from the house should be

....a. kept in open pails and later fed to the pigs or chickens.

....b. dumped in a convenient pile and left to dry up.

....c. kept outside in a covered container and then buried.

....d. spread out in the back yard to dry.

2. A person who has trouble in seeing well should

....a. buy ready-to-wear glasses.

....b. use his eyes more so as to give them exercise.

....c. have his eyes examined by an eye doctor.

....d. get along the best he can without help.

Go on to the next page.

3. A man has been bitten by a strange dog. The dog should be

....a. killed and the man should put iodine on his wound.

....b. shut up and the man should go to a doctor at once.

....c. killed and the man should go

....d. shut up and the man should put iodine on his wound.

4. A woman is going to have a baby. She should **first** go to the doctor

....a. as soon as she thinks she is going to have a baby.

....b. the first time she feels ill.

....c. just before the baby is born.

....d. after the baby is born.

5. A child has a rash. He is not very sick. His mother cannot take him to a doctor, because the roads are bad. There are several children in the family. What should the mother do?

....a. Keep one of the older brothers or sister indoors to play with him.

....b. Send him to school.

....c. Keep the child home but let him play outdoors.

....d. Keep the child quiet indoors by himself until the rash is gone.

6. A boy at home alone opens a can of meat and then does not eat all of it. What should he do with what is left?

....a. Throw it away.

....b. Leave it in the can on the shelf.

....c. Leave it in the can but put the can in a cool dry place.

....d. Put it in a covered jar or dish.

7. In choosing the clothes you are going to wear to school, you should thing first of all whether or not they

....a. are suited to the weather.

....b. are new.

....c. are stylish.

....d. will show dirt.

8. If a can of oil or kerosene in a house catches on fire, the first thing to do is to

....a. carry the can outside of the house.

....b. pour water on the flame.

....c. cover the flame with sand, salt, or a blanket.

....d. run out of the house for help.

9. Your friend has cut his foot. The blood is spurting from it. The doctor cannot come for several hours. What should you do?

....a. Put on a tourniquet, loosening it every ten or twenty minutes and cover the wound with a clean bandage.

....b. Have your friend sit in the sunshine with the wound uncovered so the sun will kill the germs.

....c. Have him bathe his foot in water and then cover the wound with a clean bandage.

....d. Put on a tourniquet and keep it tight until the doctor comes.

10. A mother nurses her baby every 4 hours. The baby cries often between feedings. His mother should

....a. feed him whenever he cries.

....b. take him to a doctor.

....c. give him milk from a bottle.

....d. pick him up whenever he cries.

11. A family lives in a house where there is no running water. A good thing for them to do is to keep water in a

....a. large, covered container and let everyone take water out in his own cup.

....b. large container and put a dipper in it from which everyone may drink.

....c. large uncovered container and use one dipper to pour water into each person's glass.

....d. large covered container and use one dipper to pour water into each person's glass.

12. A family is camping. There is a pool of water nearby, but no other drinking water. The children are thirsty. What should they do?

....a. Take a chance and drink the water.

....b. Drink no water at all.

....c. Strain and boil the water before they drink it.

....d. Let the water stand in a covered pail until it settles before they drink it.

13. A man has not been feeling well. His head aches and his stomach is upset. He should

....a. go to a doctor to find out what is wrong.

....b. ask the druggist to give him some medicine.

....c. go to work just as if he feels all right.

....d. take pills which the doctor gave him the last time he was sick.

14. A boy was examined by the doctor. The boy was a good football player. The doctor told him that the X-ray showed he had tuberculosis. The boy said he felt well. What should he do?

....a. Go home from school and stay in bed.

....b. Go to the doctor again if he does not feel weel.

....c. Continue to play football and not tell anyone what the doctor said.

....d. Do whatever the doctor tells him to do.

15. The sheets from a sick person's bed should be washed in

....a. cold water and dried slowly.

....b. hot water and dried in the sun.

....c. warm water and dried in the shade.

....d. hot water and dried in the house.

16. Stables, stock pens and privies should be built on

....a. land that slopes away from the well and house.

....b. a high spot of ground which slopes toward the house.

....c. any level piece of ground where it is easy to build.

....d. the lowest spot on the grounds.

17. A boy was at home alone, playing near an open fire. Suddenly his clothes caught fire. What should he do?

....a. Run out of the house shouting for help.

....b. Run to the well for a bucket of water.

....c. Wrap himself in a rug or blanket.

....d. Remove his clothes as quickly as possible.

18. If you begin to get a sore throat, running nose, or breaking out on the skin during the school day, you should

....a. let it cure itself.

....b. go to the teacher or school nurse for advice.

....c. leave school at once and go to bed.

....d. wait until school is over and then ask a friend for advice.

19. A family moves to a new home. The public health nurse tells them that the water has been tested and it is unsafe for drinking. The well is open and is located on a low piece of ground near the house. They cannot afford a new well. They boil their drinking water. They should

....a. not do anything about the well until they can afford a new one.

....b. also put chlorinated lime into the water in the well.

....c. also cover the well, build a curb around it and install a cylinder type pump.

....d. drink as little water as possible.